The Builder.

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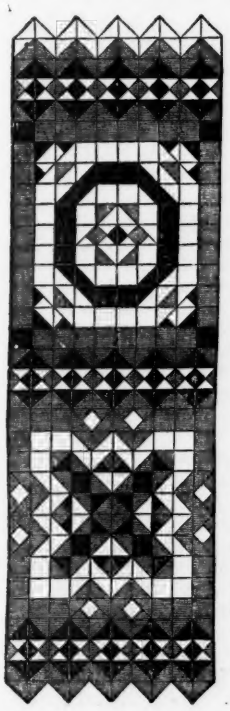


The New Project for a Channel Tunnel.

ONCE more the question of constructing a tunnel under the Straits of Dover, which has so frequently been brought before the public, is upon the *tapis*. On the present occasion, it is right to admit, the previous projects have been pretty fairly reviewed. There is, moreover, a degree of diffidence, and a candid admission that many questions can be solved only by the test of actual experiment, that give evidence of a caution not always to be found in projectors. The subject, thus presented to the public, is by no means to be encountered with that ridicule which was very properly called for by some of the former schemes. Nor is it one to be met with a peremptory condemnation on positive engineering grounds. Investigation, however, of the proposed undertaking is desirable, whatever be the result of the best judgment that we may be able to bring to bear upon its principal features.

The first idea that occurs to the mind is, that the spirit of engineering enterprise, the absence or silence of which for so long a time too many of us have reason to regret, must have a more persistent vitality than has been generally supposed. Thirty thousand pounds, we are told, are asked for, and are found, or are expected to be found, for the purpose of experiment. Considering that the result of such an expenditure, if made as proposed, can be little more than to throw some additional light on the geology of a part of the English shore, with a distant hope, perhaps, that if anything should grow out of it the subscribers might be allowed to participate, the public spirit and disinterested munificence displayed are calculated to inspire us with long dormant hope. If such a sum be forthcoming for the mere purposes of investigation, what may not be expected for the accomplishment of those numerous practical methods of employing money in agricultural engineering, which, not as matter of estimate, but as subject of demonstration, would yield such golden return?

The object of the Limited Company, we are told, is to sink a shaft on the English side of the Straits of Dover, and to drive a driftway about half a mile beyond low-water mark. One question concerning the engineering practicability, or otherwise, of constructing a submarine tunnel, depends on the continuity, or the reverse, of the *strata* which are known to exist on either shore. That these dip towards a junction is ascertained. The inclination on the opposite sides of the Channel varies considerably, being nearly three times as sharp on the French side as it is on our own. The mode in which these anticlinal lines meet, the existence of a more or less serious disruption of strata at the junction,—in fact, the geological cause of the formation of the Channel itself, forms the real key to the engineering features of this part of the subject. What light is expected to be thrown upon this essential problem by the construction of a shaft and portions of a driftway at Dover we do not yet clearly make out.

The name of M. Thomé de Gamond is associated with that of several English engineers as concerned in the proposed enterprise. M. de Gamond, we are told, has for some thirty-seven years made a special study of the Straits of Dover. It scarcely justifies the scorn with which he speaks of competing projects, that the proposal, made by this gentleman in 1840, for a method of uninterrupted communication between Great Britain and the Continent, involved the filling up of the Straits of Dover. "*Point de Pyrénées*" was a joke to this. A solid and substantial mole was to be built from shore to shore. The modest sum of 34,000,000*l.* was allowed for the estimated cost; and the maritime power and supremacy of Great Britain were to be propitiated by the kind provision of leaving three gateways or navigable apertures through the mole. None but people who are ready to go to war for an idea could have been expected to originate such a scheme. More than that, no other people could be likely to appreciate it. The blind and incurable prejudices of the maritime interest could not be sufficiently enlightened to regard the grand project with favour. It shows a remarkable degree of confidence on the part of the promoters of the limited company, that they should put forth the name of the projector of this mole as that of one of their engineers.

Whatever be the practical experience, or the sound judgment, of M. Thomé de Gamond as an engineer, he seems determined to add the laurels to be reaped in another profession to the credit due to the constructor of magnificent works on paper. In 1856, M. de Gamond was occupied with a project for a submarine tunnel. He dived several times to the bottom of the Channel to obtain specimens of the clay, on the last of which occasions he was attacked and severely bitten by conger-eels. It does not appear how either of these interesting facts sheds much light on the subject of the geological substructure of the trough of the Channel. But as two objections—one political, the other engineering—were urged against the advantage and the feasibility of M. de Gamond's scheme, he says, that he was content to meet them by what advocates call pleas. These are explained to be statements introduced in order to gain the success of a cause. It is not proposed that, this success once obtained, any further reference is to be made to the pleas. One of these pleas seems to have been a relic of the original idea of the mole. Twelve artificial islands were to be manufactured in the Channel, in each of which shafts were to be sunk, from which the excavation of the tunnel was to be carried on in each direction. We are aware that the construction of a shaft through a species of artificial island was successfully carried out as a part of the water-works of Chicago; but the idea of studding the Channel with artificial shoals and invented dangers could only occur to persons ignorant of, or hostile to, that maritime occupation which forms the very life of British power.

The other plea, in reply to the objection that we were not anxious to abandon the military defence of that wall of salt water which has kept our soil unprofaned by hostile foot for 800 years, was, that valves might be provided for the inundation of the tunnel in case of its being required for invasion. As it is well known that all the preliminaries of war between hostile nations are now invariably arranged on the courteous and considerate plan which requested the "gentlemen of the French guard to fire first," we must take the second plea also for what it is worth. We must further note that the approbation which the ex-Emperor of the French is stated to have expressed of the project of uniting the two countries by a tunnel may be regarded under very different lights by French and by English eyes.

Mr. Low, of Wrexham, has brought to bear on the subject of the proposed submarine communication the experience of a practical miner; and has suggested, what we have ourselves more than once pointed out as a requisite of all lengthened tunnelling, that a double driftway connected by passages, and admitting of the mode of ventilation practised in ordinary coal mines, was the only method on which such an enterprise could with propriety be commenced. In reference to this, however, the improvements made in boring apparatus, and the aid to ventilation afforded by the escape of the compressed air by means of which such machinery is worked, have now to be taken into consideration.

For ourselves, we cannot but think that the political, or rather military, aspect of the case, is one that demands attentive consideration. Much may be said in favour of articulating our railway system with that of Continental Europe. Little doubt can be entertained that the international traffic that would be created by such a step would be very large. But other considerations must also be regarded. We have recently seen what large expenses the people of this country have incurred, and, as we think, wisely incurred, for making Portsmouth into an impregnable harbour for a war navy, intended to defend our coasts. Our annual budgets owe some three-fourths of their pressure to our efforts, past or present, to defend Great Britain from any possible attack. Works larger than any yet effected are known to be under consideration. The defence of London by a chain of detached forts is a subject on which military studies have been made, and as to which Parliament will probably be asked to provide means. There is no indication, at present, that it will be asked in vain. Unfounded security, and undue panics, have succeeded one another for some considerable time. Political capital has been made, at one time by short-sighted and eventually costly reductions of proper expenditure; at another by over zealous effort to repair these injuries to our power. The present feeling is, let us once for all put a stop to such discreditable vacillation. Let us see, since human nature is what it is, that our coasts are in a state of defence, our navy efficient, our army the very finest that can be formed out of such limited numbers, and then let us turn our attention to the conquests of peace. That, we think, is the common-sense outcome of all the long debates on the subject. It is matter, therefore, at least for consideration, whether we should be wise, at such a moment, to open in our ancient defences a new back-door, through which a robber might unawares break in. It is all very well to say that this postern shall be plated with iron, and provided with bars and locks. The question is, whether this is exactly the time to break through the wall to make it. The fortifications of Portsmouth and the Anglo-French Tunnel represent two opposite orders of ideas. Is it quite consistent to attempt the simultaneous prosecution of the two?

There is no doubt, were the incoming year to approach us, like the ambassador of Rome to Carthage, bearing peace and war beneath the folds of his toga, and asking which we would choose, what our reply would be. Peace and goodwill among mankind is, or ought to be, the aspiration of every good man. In none is that desire more strong than in those great military chieftains on whom has fallen the onerous responsibility of high command in actual service. There never was a man who had a keener sense of the horrors of war, or a more anxious, patriotic desire that his eyes might never witness their enactment in his native land, or indeed in

Europe, after his great struggle of 1815, than Arthur, Duke of Wellington. The blessings of peace, the growth of commerce, the augmentation of national wealth, the increase of human happiness, are matters which we not only desire, but in forwarding which to the utmost of our power we most of us pass great part of our lives.

For all that, we should be the worst of fools to forget the lessons of 1851, of 1866, and of 1870. Men whose philanthropy was much in advance of their knowledge of human nature, and whose acquaintance with the profits of commerce was much more accurate than their knowledge of history, had come to the conclusion that King Pocket's reign had come, and that the reign of King Pocket was peace. Our great brilliant summer palace of 1851,—that crystal and iron structure which had all the lustre, and something more than the permanence, of a bubble, was to be the temple of perpetual peace. Men's eyes were to be opened by education, their prejudices dispelled by mutual intercourse, and their peaceful relations secured by reciprocal interest. We know, however, what came of it. We have seen how an era of revolution and civil war, not ended, but suspended, by the most terrible military and national collapse on record, has been ushered in by these cries of "Peace, peace." What we do not know,—what few of us have heard, and still fewer realised, is the unprecedented magnitude of the river of human blood that has flowed during the past decade.

That calculation which earned an American general the title of butcher,—the calculation that if his forces were twice those of his antagonist, he might expend man for man and have half of his army left,—has been distanced altogether by the more ghastly arithmetic of the German war. We never heard of less than 150 men coming unhurt out of a battle, as the sole representatives of a regiment which went under fire 3,000 strong. It is no exaggeration to say that, in the earliest encounters, when the French had the advantage of admirably chosen positions, and of the destructive fire of the mitrailleuse, and before courage, discipline, and military character had been exposed to the demoralising influence of defeat,—the terrible word,—the once terrible word, decimation, had to be spelled backwards with regard to German regiments. It was not a tenth that they lost, but nine tenths. It is true that no other generals in the world would have dared so to handle troops. It is true that no other troops in the world would so steadily have marched to certain death. Over and over again, as a line of soldiers reached the summit of a hill, exposed to the deadly fire of the defenders, they fell, in line, like a swathe of grass in a meadow before the mower. Let us remember these things, and let us ponder well before we attempt to bridge the Channel otherwise than by steam. The oracle of Delphos gave a reply to the Cnidians, when they proposed to cut through the Isthmus of Corinth, that is not inapplicable to this question,—

> "Delve not, nor towers upon the Isthmus pile:
> Had Jove so will'd, himself had made an isle."

Neither the military events of 1870 and 1871, nor the internal condition of France since the close of the war, have been such as to lead us to suppose that the present is the exact moment in which to seek to alter the geographical relations existing between the British Islands and the Continent.

It may, it is true, be urged in reply that, even if the scheme be at once taken up, and carried out with all possible despatch, we need be under no apprehension of any very proximate political or military consequence, as it will take up the lifetime of a generation to make both ends meet. There is some truth in this argument. The experience of the longest tunnel yet made in the world bears, more closely than do such small details as those of the driving headways of 600 or 700 yards long through the upper chalk, upon the anticipations we can form as to the rate of progress. That actual rate, as we will show, would require the period of thirty-seven years for the completion of a tunnel beneath the Channel.

We do not treat this question as an engineering impossibility. Far less do we assume its practicability. We have made great advances within the last ten years in the art of mining. The success, engineering if not financial, of Mr. Barlow's little tunnel under the Thames, near the Tower, is a matter not to be ignored. Mr. Barlow, with commendable caution, constructed an iron tube as the shield for his miners, and the lining of his tunnel. Yet such was the combination of skill and good fortune in the selection of the impervious stratum through which the little gallery was driven, that we can say, from personal examination, that a 6-ft. culvert might have been driven through the clay, and bricked within, without the use of any shield at all. This is, no doubt, an exceptional case. It was due to the existence of a bed of solid clay, such as the results of no less than thirty-nine borings led Brunel to anticipate in the line of his own tunnel, which could be pierced and lined before any action of a semi-fluid nature had appreciably commenced. It gives us no encouragement with regard to working through pervious strata. Nor do we suggest that the favourable nature of the ground actually passed through would have justified any relaxation of the precautions adopted. Still, we have here a definite addition to our experience. We have an important fact to set against the terrible difficulties which the genius of Brunel overcame in carrying his work though the loose and crumbling material of what was really the artificial bed of the Thames. We must take either experience for what it is worth. Each is a contribution to engineering science.

Again, we have had the experience of the completed Mont Cenis Tunnel. That is another point gained. We have information under separate heads from this great work. We have found it to be possible to drive a tunnel, from either end, without shafts, of a length never before attempted, so as to meet both as to line and as to level. We are told that the error in coincidence of the two lines, one of 7,000 yards in length, and the other of 6,860 yards, was under 3 ft. This is a great triumph of engineering skill. Secondly, we have the experience of the boring apparatus. We know the economy of time and of cost thus effected over the manual labour familiar to our early days. We have also important observations as to the reduction of temperature by the use of compressed air,—a matter of extreme importance in contemplating the possibility of making 11 miles of unventilated tunnel. The difference of temperature at the entrance and at the working face is stated at 22 degrees Fahrenheit. What the latter would have been but for the jets of air constantly issuing from the working cylinders, and causing a descent of the thermometer exposed to the jet to 7 degrees of frost, our mining friends can readily estimate.

Again, as to the rate of progress, we have valuable information. From the date of the commencement of the tunnel, August 15th, 1857, to that of the meeting of the workmen under Mont Frejus, December 26th, 1870, was 4,880 days. Taking the greater distance accomplished, which was that on the Bardonnèche, or Italian side, at 7,000 yards, we obtain an average progress of 1·43 yards per diem. The long period elapsing before the tunnel was open for the transit of trains must be added to the above-named period; but as that delay was due rather to political than to engineering causes, it cannot be reduced to figures. Again, we have the element of cost. That of the Mont Cenis Tunnel, dividing the capital by the length, was somewhat under 200*l.* per yard. And rock of a very obstinate character occasionally occurred, which both retarded the progress and augmented the average cost.

A tunnel 22 miles long, executed at the rate and for the price of that under Mont Cenis, would thus require for its completion a period of thirty-seven years, at a minimum cost of seven and a half millions sterling. We are not arguing that the cases are parallel, but merely giving the results of a comparison. To offer even an estimate of cost, or to rate the progress, not by days, but by years, we must know more than any one appears to do at present of the geological nature of the bed of the Channel. The exact length of the Thames Tunnel is not stated in the Life of Brunel. The expenditure was 454,000*l.*; which, divided over the approximate width of the river, gives a cost of about 1,300*l.* per yard.

It will be said that the progress through the dense strata that underlie the Alps was necessarily slower than would be the case through those of the submarine tunnel. That a passage would be made through a mountain barrier consisting of chalk more rapidly than through one of harder material, we admit. But it must be remembered that there are very special practical advantages attending the driving of an adit, or working of a gallery or tunnel from two ends, as compared with working from shafts, which affect cost and rate of progress, as well as safety and comfort. A gallery thus driven is, or should be, always carried on a slight ascent, so that the drainage can be effected without engine power, and the material from the excavation is thus readily disposed of. The Alpine tunnel was constructed on a rising gradient from each end, although the so doing involved the introduction of a gradient of 1 in 43, instead of 1 in 90, which would have been attainable if the tunnel had been all on one inclination. In the Channel tunnel, on the contrary, we must commence by the sinking of a land shaft or shafts. The depth to be penetrated must be equal to that of the deepest part of the trough of the sea to be passed, *plus* the thickness of crust necessary to be left over the head of the workmen, *plus* the rise of an ascending gradient, steep enough to effect adequate drainage, of eleven miles. It will depend on the dryness or wetness of the strata pierced what this allowance is to be. Altogether we find that we must sink shafts of considerable depth,—in themselves matters of some expense,—up which every gallon of water that enters the tunnel must be pumped, and every ton of material excavated must be hauled. This may be fairly taken to counter-balance any presumed advantage from a less resisting medium.

On the important question of the geological character of the anticlinal beneath the trough of the Channel no light can be thrown by the proposed outlay. M. de Gamond considers that this meeting is under the Varne bank. If it should be practicable to make any serious investigation in this locality, the results might be important. To reach this place by driftways was reported, in June, 1868, by the engineers now concerned in the scheme, to require from one million and a half to two millions sterling, or one-fifth of the entire cost of the tunnel. The practical course, if the matter were seriously taken in hand, would be to drive a driftway from the shore nearest the point of supposed junction of the strata till that position was reached, or until reaching it was proved to be impossible. In that case we should have that positive information in the absence of which the scheme of a submarine tunnel can only be characterised as one that is extremely problematical.

There is, however, one primary consideration, in presence of which we must confess to some astonishment that the public should be asked to find 30,000*l.* without something like the same number of pence having been previously devoted to the purpose of showing that there exists even a *prima facie* case. One of the best known geological features of the earth is the riverless, streamless, condition of the great chalk wolds. In valleys and hollows where, in other formations, brooks and lakes are found, the chalk formation is dry. The reason is the pervious nature of the material. The rain sinks through it as through a sieve, and descends until arrested by an impervious bed. Nothing but excessive evaporation (as in the case of the Dead Sea and of the Bitter Lakes) is known, that can reduce the level of a great subterranean reservoir of water below that of low water in the sea. It is, therefore, our opinion, that the whole of the chalk below this level, without any assumption of infiltration through the bottom of the sea, is as full of water as a sponge. Through such a formation, subject, moreover, to a great hydraulic pressure, tunnelling would be extremely dangerous and costly, and the formation and maintenance of a driftway, unlined with masonry or with metal, would be an impossibility. We know that water is found at the level of the sea in chalk wells at Dover. We have reason to believe that the level of the subterranean lake which the chalk holds dips downwards from our inland chalk districts to the sea. The sinking of a single well for from 100 ft. to 300 ft. below the level of the sea through the chalk would be enough to verify or to correct this opinion. That, we take leave to point out, is the first step which ought to be taken by the promoters of a submarine tunnel. The information thus to be obtained would not, indeed, prove the practicability of the enterprise; but it might, on the other hand, demonstrate its utter impracticability. Engineering and geological theory are against that practicability.

We think no persons can with propriety appeal to the public for money until the simple step that we suggest shall have been taken. According to our best present knowledge we are asked for 30,000*l.* for an entirely impracticable scheme.

ON THE CONSTRUCTION OF THE ALBERT HALL.

AT the ordinary general meeting of the Institute, held on Monday, the 22nd inst., Mr. T. H. Wyatt, president, in the chair, a paper "On the Construction of the Albert Hall," was read by Major-General Scott, C.B. We give that portion of it which relates more particularly to constructive details :—

The whole of the main wall was constructed of hard Cowley stocks set in Portland cement with three parts of sand. Portland cement was also in all cases used for the concrete necessary to bring the gravel surfaces which were to receive the foundations to a true level, and to fill in the excavation in the clay bottom, which extended on the south and south-east sides over one-third of the area occupied by the building. The outer wall, built in bricks made by the contractor, was also brought up to the level of the shallowest footings in Portland cement mortar of the above composition; but all above this, and all the cross walls and the walls within the main wall were executed in mortar made in a mill, with one measure of grey lime previously slaked, one measure of Portland cement, and six measures of sand. The set of this mixture was sufficiently rapid to prevent any settlement taking place which might bring an undue strain on the terra-cotta dressings. It also enabled the main wall to be completed to its full height, and the roof to be commenced before the outer wall and cross walls were brought up, and in no instance did any such inequality of settlement from this cause take place as to produce fracture. The outer wall was, of course, delayed for the terra-cotta. Delay in the supply of this material appears to be an ever irritating difficulty in its use.

The plastering used on the interior walls merits, perhaps, some attention. Instead of making the lime into coarse stuff, as is usually practised, and finishing with lime or gauged putty, the grey chalk lime of the Medway was ground to a powder and made into mortar on the following system:—One quarter of a cubic foot of plaster of Paris was stirred into a bucket of water and thrown into the pan of an ordinary mortar-mill, so as to make a milky fluid of the plaster of Paris; another bucket of water or so was then added, and 5 cubic feet of the ground grey lime gradually added, with the addition of more water, the mill continuing in action the whole time until the pan contained a thin slip of the lime and plaster. To this mixture 30 cubic feet of sand were added and thoroughly incorporated with it, and the mortar was then ready for use. Thus treated the lime sets without slaking, and makes what I have termed "selenitic mortar."

For the finishing coat in rough stucco, the quantity of sand was reduced to 20 cubic feet, and after the first coat was put on the wall, the plasterers could in a few hours' time follow on with the finishing coat. For the first coating on lathwork the usual quantity of hair, but unbeaten, was added whilst the mortar was being incorporated, and the ceilings were finished with a mixture of slip prepared as before, with one part of chalk and two parts of sand for every part of lime used in the slip.

The whole of the outer corridors, staircases, and crush-rooms, and all the private and refreshment rooms round the building, are, as it is termed, fire-proof, no wood being used in their construction beyond that of the doors, windows, and the wood slips used to carry the concrete and tiled floors. Probably, in the case of a fire in the interior of the Hall, the title would not be belied, for the inrush of fresh air would be so great as to keep all without the auditorium perfectly cool. Since also the audience empties itself into these corridors and crush-rooms in a few minutes, there is no great likelihood of loss of life in the event of a fire occurring. As precautions against fire, hydrants are fixed at several points on each floor level, the whole being in communication with thirty tanks on the picture-gallery roof, containing in all nearly 50,000 gallons of water. These tanks are supplied from a well sunk through the London clay into the chalk, in the rear of the building, and they also receive the rainfall on the large roof. The hydraulic lift is supplied from the same sources.

In the warming and ventilating arrangements I had the assistance of Mr. W. W. Phipson, who has had great and varied experience in the heating of large buildings. Coils of hot-water pipes are placed in three separate air-chambers, under the arena, the amphitheatre stalls and the main corridors of the building respectively. The heated air from those in the arena ascends through the interstices of the floor; that from the coils under the amphitheatres through the risers of the steps on which the seats are placed; and that from beneath the main corridor finds its way through passages in the wall into the boxes, the picture-gallery, the corridors, the refreshment and private rooms and small lecture-theatres. The external fresh air is forced in by two fans, 5 ft. 9 in. in diameter, each worked by a 5-horse power engine, and blowing right and left through passages provided for the purpose into the three above-mentioned air-chambers. It may also be drawn through them by the ascensional current of heated air in the Hall itself, which, when the gas is lighted, or the building warmed in cold weather, exerts an enormous force. The amphitheatre and corridor air-chambers, with their systems of coils of hot-water pipe can be together utilised for the Hall, or for the corridors and private and other rooms. In order to preserve equality of temperature in all parts of these chambers, the coils of hot-water pipe are divided into sections, each section having its own hot-water generator, in which the temperature is kept up by a supply of steam from three 25-horse power steam boilers at the back part of the building. There are sixteen such generators, each supplying its own system of pipes, with and admitting of hot water being put into action or thrown out at will. The total amount of heating surface in the various coils is represented by about 28,000 ft. of 4-in. hot-water pipe.

The chief difficulty in connexion with the management of the warming and ventilation of such a building is the control of the inward draft when the doors are open from the ingress and egress of the audience; but by carefully attending at these times to the closing of the louvres of the upcast shaft through the centre ring of the roof, this draft can be controlled.

The conditions prescribed for the exterior were, as I have said, that the façade should consist of red brick, with terra-cotta dressings. The subject of terra-cotta as a decorative building material has been so fully treated of by Mr. C. Barry that it is unnecessary for me to do more in relation to its use in the Albert Hall, than refer briefly to the principles which guided us in its application and treatment. The terra-cotta material was considered simply as a superior description of brick, to be used in conjunction with plane surfaces of a somewhat similar material, but of another colour. It was thought therefore unnecessary that the lines and edges should have the precision of stonework given them, or that the blocks should be of large size. It was further judged that delicate modelling would be out of character with a building which must be of very massive appearance, and which should depend more for its effect on the sweep of its lines than on exquisite finish. These opinions were held strongly by Mr. Townroe, to whom the hall is indebted for the actual modelling or immediate superintendence of the whole of the modelling work, and I judged them to be correct. Many, undoubtedly, think that the modelling is too coarse, but I have been gratified to observe that the eye of the painter is generally pleased with the picturesque effect which this mode of treatment has imparted, an effect to which doubtless the varied and rich tints of the material itself have largely contributed.

The terra-cotta was all supplied by Messrs. Gibbs & Canning, of Tamworth. The blocks for the preparation of the moulds were supplied to them by us, and the terra-cotta work was fixed by masons furnished by the building contractors.

The terra-cotta of Messrs. Gibbs & Canning is prepared from fire-clay, without foreign admixture, and is burned at a high temperature, such as promises to render it very durable; the blocks are not made in the manner followed by Messrs. Blashfield & Blanchard, with cells which have to be filled in with concrete or grouting, but are chambered from behind, so that the brickwork of the wall can be built into them. It is necessary, therefore, in estimating the cost of fixing of this terra-cotta to allow for the extra brickwork necessary; but of course there is a saving of grouting and concrete, and it appears to me to make a better job than the blocks with the cells closed at the back.

The red bricks employed in conjunction with the terra-cotta were supplied by Mr. W. Cawte, of Fareham. They are very heavy and hard, having, if I may use the expression, a metallic-looking and slightly conchoidal fracture, are little absorbent, and are for beauty of tint unsurpassed by any bricks in the kingdom. I was indebted to Mr. Gilbert Redgrave for the whole of the work connected with the preparation of the terra-cotta, as well as for his general advice and assistance in every part of the work; and Mr. Verity was charged with the preparation of the constructive working drawings.

It will be observed that on the exterior of the wall of the picture-gallery in the original design the surface was broken with decorative panels of Geometric design. It was suggested to me by Mr. Henry Cole that this wall gave a fine opportunity for a mosaic picture of figures which he thought should be considerably larger than life-size. My assistant, Mr. Townroe, on the other hand, while he approved of the notion as much as I did, was strongly in favour of reducing the figures to nearly half life-size; and Mr. Gamble, who was much consulted throughout, and who was my boldest adviser in most cases of doubt, supported him. In this conflict of views, I resorted to the counsels of the weak and prudent, and adopted the middle course, which had to my mind this recommendation. The first idea of a spectator would be that they were life-size, and although the apparent magnitude of the building might be enhanced by a reduction of the figures, it was better that such an expedient for producing effect should not be attempted, as the balcony immediately below it, with or without living persons standing on it, would certainly reveal the truth. On the other hand, I saw no reason to reduce the apparent size of the building for the sake of a fine mosaic picture. The figures, by the advice of some of the artists who undertook to prepare the designs, were finally made something over full life-size. It was at the same time arranged that the colours should be buff upon a chocolate ground, and that the outlines should be black. These points were settled in conjunction with Messrs. Pickersgill, R.A.; Marks, A.R.A.; and Yeames, A.R.A. The other artists who contributed designs were Messrs. Armitage, A.R.A.; Poynter, R.A.; Horsley, R.A.; and H. Armstead. The frieze was divided into sixteen lengths of about 50 ft. each, some artists taking two or three such lengths, and the sum accepted in payment for the work was so moderate as to entitle these gentlemen to the warm thanks of all who are interested in the application of pictorial art to architectural buildings.

This valuable series of designs is exhibited this evening on your walls. They are drawn on a scale of 6 ft. 6 in. to the foot, and the task of enlarging them to the size of the proposed mosaic reproductions was entrusted to Sergeant Spackman, of the Royal Engineers, who was fortunate enough, as I believe, to make the enlargements to the entire satisfaction of the artists. He prepared small photographic negatives from the originals, and by means of a camera, illuminated with a lime-light, threw an image of the required size on to a screen covered with paper, upon which the necessary outlines were then put in with black lines. Sergeant Spackman, who is himself an artist, determined as a rule the thickness of the lines to be used, but on this point he consulted the artists whenever he was able to do so. The thicknesses of the tesseræ employed in translating these enlarged pictures varied from $\frac{1}{8}$ of an inch to $\frac{1}{4}$ of an inch in five gradations.

It would occupy your attention too long to describe the process by which the mosaic workers produced the actual ceramic pictures on the walls of the building, and I have said sufficient to enable an opinion to be formed of the feasibility of the more general adoption of this species of mural decoration. I would only observe that the flat treatment in this case was not selected from a conviction that it is in itself superior to a treatment in relief for exterior decoration, but because the latter mode would have been very difficult or impossible, for two reasons:—First, it would have been hard to find a body of modellers who could have executed in the given time 800 ft. of full-size figures in relief, with the same degree of excellence as could be secured by adopting the work of the painter instead of availing one's self of the sculptor's art. Secondly, if this difficulty could have been got over, the means at my disposal were quite insufficient to have met the expense of executing the work by the assistance of the latter. The total cost of the frieze, including the designs, their enlargement and fixing, was 4,426*l.*, and its area is 5,200 square feet. Has this decoration been too dearly bought? To say that another mode of decoration would be more effective, if that mode be impossible under the

conditions of the case, will not settle the question of the mosaic flat treatment being or not being one that ought to be repeated. In discussing the question, the facility with which the artist's work can be effectually rendered in mosaic work without much artistic feeling or knowledge of the human figure on the part of the operator ought not to be lost sight of. For modelling in relief every workman employed must be an educated artist, unless the architect is satisfied that want of art shall be the characteristic of the work. May I be permitted to suggest, also, in favour of a flat treatment, that in London soot deposits and birds' nests have somewhat marred the effect of the sculptured figures in the pediments of our public buildings?

The Messrs. Lucas Brothers were the chief contractors, and the well-known character of their foremen, their boldness in meeting the views of the architect, and their ability in coping with the most formidable difficulties did not forsake them here. For clerks of the works I had Mr. Hemsley, who showed the most zealous attention to his work; and Mr. Sankey, who superintended the preparation and fixing of the roof to my entire satisfaction. I was also much indebted for assistance to many other gentlemen, but I must not detain you by particularising the nature of the assistance they rendered. I ought not, however, to pass over the name of Mr. Charles Stephenson, who afforded me great assistance throughout the whole work.

DISCUSSION ON THE REPORT OF THE ROYAL SANITARY COMMISSION.

A MEETING was held at the Rooms of the Social Science Association, Adam-street, Adelphi, on Monday evening, January 22nd, when a discussion took place on the Report of the Royal Sanitary Commission. Mr. George Godwin presided.

The Chairman, in commencing the proceedings of the meeting, said that it was of the greatest importance that steps should be taken to keep the subject then to be considered before the public. We had just recovered from the alarm caused by the gloomy anticipations of what would have been a frightful loss to the whole community; and the cause of this was intimately connected with sanitary matters. Public opinion was in a state of excitement on the subject. Whether this excitement would speedily pass away with no definite result, as had been the case on many similar occasions, and whether the Legislature would act with effect, remained to be seen. It was their duty to urge the necessity for the consideration of sanitary measures, and of proper steps being taken to put matters on a better footing than now. He had heard, on other subjects, measures proposed in meetings of this Association, which at the time were not listened to by the general public, or were denounced as impracticable, but which afterwards had been generally adopted. He trusted that the present discussion, which he then invited Mr. Hastings to open, might have a good effect, and that in a matter which concerned the public good so much as the present, we might speedily see a great change.

Mr. G. W. Hastings said the Report of the Royal Sanitary Commission had a very wide scope; but in his opinion the chief points in it were, firstly, the constitution of the Board, to which it was proposed to entrust the carrying out of the measures to be adopted; and, secondly, the executive officers who were to be their agents. He was not sanguine that a complete measure of sanitary reform would be speedily passed, and he doubted if the subject could be dealt with satisfactorily in a short period of time. If one or two points could be settled in the next session, and those upon a right principle, we should have made more progress than if the whole subject were considered and settled hastily. The present arrangements in regard to sanitary matters were absurd, and often involved a conflict of authority between those who had charge of the different departments of the same work. To reconcile those conflicting local authorities, or supersede them by a better arrangement, was a very desirable thing. He had formerly expressed the opinion, which he still maintained, that in rural districts the proper authority in such matters as these was the county or its principal officers. In towns of some size the town councils might have the control, as being the best available body. In the rural districts the great obstacle in the way of improvement was the intervention of private interests. The only way to eliminate this was to raise up an authority which would be superior to it. He thought that this authority might be confided to the Justices in Quarter Sessions. In addition to other qualifications, he believed the fact that they were not elected was an important one. The representative principle did not suit every case, and this was one to which he thought it wise not to apply it. The proposal that the present Boards of Guardians should exercise this authority in sanitary matters he did not agree with. He understood that Mr. Stansfeld was in favour of a County Board of Guardians to be chosen by the present Boards from among themselves. This plan would amount to a virtual disfranchisement of the present *ex officio* members of the Boards. Mr. Goschen's plan to give half the seats on the Board to the ratepayers, and half to the Justices, was more in harmony with his own ideas. This was a kind of revival of the old County Courts. The School Boards had been offered as a model, but these were far from being free from bias, and the objects for which they existed did not in every case have the first place in the minds of the members. He thought that should the election of sanitary Boards be confided to ratepayers, the efficiency of the arrangements would be not so much considered as the question of expense. The calm judicial mind which the Board of Justices would bring to bear upon such matters as questions of compensation, and other sources of dispute, would be highly useful. In matters which now come before these bodies, the impartial and impassive way in which they are considered, was a noteworthy fact. In the higher functions of politics, the necessity of separating the different departments was apparent, but this necessity did not exist in matters of local government. He, therefore, should not object to the union of legislative and judicial functions in the proposed Boards. In regard to the officials to be employed under the Boards, the wisest plan would be, he thought, to obtain the services of a few highly-trained men, and pay them well, rather than to endeavour to multiply officers with insufficient payments. One or two such officials would be able to serve each county efficiently. The geography of the Poor-law Unions was useless for sanitary purposes; to carry these out properly, we must follow the watersheds. There should be no such conflict as we have now; but all matters of irrigation, sewage, and such like should be brought under the notice of one authority. Each county can now appoint an analyst; and this appointment had been of great service. In like manner, the county might appoint its one or more health officers. If such a measure were enacted, it would be a step in the right direction,—an instalment of a future more perfect measure. In conclusion, he hoped the meeting would not be content with the small areas proposed by the Report, but would recognise the principle that the wider the legislature the more likely it would be to work satisfactorily.

Mr. Webster, Q.C., condemned the proposed small areas, and agreed with the principle of making the watersheds the sanitary districts. He thought the Justices would make very bad sanitary administrators, and desired no half-measures, but a complete and comprehensive scheme of reform.

Dr. Rogers spoke of the impracticability of entrusting sanitary matters to Boards of Guardians. He favoured the idea of committing them to the Court of Quarter Sessions, and thought a system of sanitary inspection might be arranged with great effect.

Dr. Rumsey coincided with Mr. Hastings in nearly all his views. He thought the Commissioners had done a great work. If they had done nothing else, they had shown what was to be accomplished. He condemned the proposed multiplication of small bodies, as destructive of efficiency. The large centres of population might be treated as the counties, in regard to the establishment of local Boards. He thought, in a general way, it would be best to follow the old lines in the apportionment of districts.

Dr. Lankester agreed in the main with Mr. Hastings's remarks. He thought it was impossible to carry out the plans of the Commissioners. He could not say anything in favour of Boards of Guardians, but must confess that he was just as much afraid of justices. He thought there should be an independent Controlling Board, similar in its constitution to the Board of Works. The present action of sanitary authorities, as, for instance, in their doings in relation to the prevailing epidemic of small-pox, was highly unsatisfactory. He desired to see a Central Board of Health established with power to enforce sanitary measures in every village.

Dr. Stallard differed in several particulars from what had been said. All the arguments of Mr. Hastings were directed against the representative principle. But he thought people could not be taxed for the support of what they did not believe in. He thought we must take the present local machinery and use it as best we could. He preferred the Boards of Guardians to the Justices. The Controlling Boards should be elected directly, and not sifted through Boards of Guardians. The best area, he thought, was that of the present unions, of which combinations might be made, where requisite, by the central authority.

Dr. Little was not disposed to wait for a complete measure until people were educated.

Dr. Stewart hoped whatever Acts might be passed that they would not clash the one with the other. He would refer the meeting to the joint report of the British Medical and the Social Science Associations in reference to the education question.

Mr. Frederic Hill made a few observations, concurring generally with Mr. Hastings's opinions.

Mr. Chadwick desired that the areas of districts should be extended, and these should follow the watershed. The engineer and the architect were important agents in the work of sanitary reform. We must look for improvement, in all the particulars, to the great landowners. He instanced the efforts of the late Duke of Northumberland in this direction as offering an example worthy of imitation. The officers he thought it was advisable to appoint by competitive examination, and not by nomination.

The Chairman said he thought no one could consider the report of the Commissioners as absurd, a term which had been used by one of the speakers, although we might not be able to agree with them in all their recommendations. There seemed to be in the meeting a unanimous opinion that Boards of Guardians were not the right bodies to trust for sanitary improvements, and that mixed Boards, consisting of magistrates and selected guardians, were preferable. He thought so too. Also that there should be superior officers of health, sufficiently paid to abandon private practice, with the Poor-law medical officers as assistants. One omission he might notice in the Report: the necessity of attention to good construction in sanitary works was not referred to. The ventilation of sewers, which should be made a law, was but just touched upon in the Report. He hoped the discussion would have some influence in the settlement of the question, especially as there was such unanimity on the main features. We could not wait till the education of the community was completed. Years had passed, and comparatively little progress had yet been made. The advancement of the human family should be the great aim of our efforts, and in our progress towards this end we should spare neither time nor money.

ON THE INFLUENCE OF GAS AND WATER PIPES IN DETERMINING THE DIRECTION OF A DISCHARGE OF LIGHTNING.*

ALTHOUGH the invention of the lightning conductor is one of the noblest applications of science to the wants of man, and its utility has been established in all parts of the world by the experience of more than a century, yet a sufficient number of instances are recorded of damage done by lightning to buildings armed with conductors to produce, in the minds of some, an impression that the protective influence of lightning conductors is of but questionable value.

The destruction, by fire, of the beautiful church at Crumpsall during a thunderstorm on the morning of the 4th inst., has induced me to bring before the Society, with a view to their being known as widely as possible, some facts connected with the electric discharge which have guided me for some years in the recommendation of means by which disasters of this kind may be averted.

For the proper consideration of this subject it is necessary to make a distinction between the mechanical damage, which is the direct effect

* By Mr. Henry Wilde. Read at a meeting of the Manchester Literary and Philosophical Society.

of the lightning stroke, and the damage caused indirectly by the firing of inflammable materials which happen to be in the line of discharge.

Instances of mechanical injury to buildings, not provided with conductors, are still sufficiently numerous to illustrate the terrific force of the lightning stroke, and at the same time the ignorance and indifference which prevail in some quarters with respect to the means of averting such disasters; for wherever lofty buildings are furnished with conductors from the summit to the base, and thence into the earth, damage of the mechanical kind is now happily unknown.

Even in those cases where lightning conductors have not extended continuously through the whole height of a building, or where the lower extremity of the conductor has, from any cause, terminated abruptly at the base of the building, the severity of the stroke has been greatly mitigated, the damage being limited, in many cases, to the loosening of a few stones or bricks.

The ever-extending introduction of gas and water pipes into the interior of buildings armed with lightning conductors has, however, greatly altered the character of the protection which they formerly afforded, and the conviction has been long forced upon me that, while buildings so armed are effectually protected from injury of the mechanical kind, they are more subject to damage by fire.

The proximity of lightning conductors to gas and water mains, as an element of danger, has not yet, so far as I know, engaged the attention of electricians, and it was first brought under my notice at Oldham in 1861, by witnessing the effects of a lightning discharge from the end of a length of iron wire rope which had been fixed near to the top of a tall factory chimney, for the purpose of supporting a long length of telegraph wire. The chimney was provided with a copper lightning conductor terminating in the ground in the usual manner. In close proximity to the conductor, and parallel with it, the wire rope descended from near the top of the chimney, for a distance of 100 ft., and was finally secured to an iron bolt inserted in the chimney about 10 ft. from the ground. During a thunderstorm which occurred soon after the telegraph wire was fixed, the lightning descended the wire rope, and instead of discharging itself upon the neighbouring lightning conductor darted through the air for a distance of 16 ft. to a gas-meter in a cellar of an adjoining cotton warehouse, where it fused the lead pipe connexions and ignited the gas. That the discharge had really passed between the end of the wire rope and the lead pipe connexions, was abundantly evident from the marks made on the chimney by the fusion and volatilisation of the end of the wire rope, and by the fusion of the lead pipe. As the accident occurred in the daytime, the fire was soon detected and promptly extinguished.

Another and equally instructive instance of the inductive influence of gas-pipes in determining the direction of the lightning discharge occurred in the summer of 1863 at St. Paul's Church, Kersal Moor, during divine service. To the outside of the spire and tower of this church a copper lightning conductor was fixed, the lower extremity of which was extended under the soil for a distance of about 20 ft. The lightning descended this conductor, but instead of passing into the earth by the path provided for it, struck through the side of the tower to a small gas-pipe fixed to the inner wall. The point at which the lightning left the conductor was about 5 ft. above the level of the ground, and the thickness of the wall pierced was about 4 ft.; but beyond the fracture of one of the outer stones of the wall, and the shattering of the plaster near the gas-pipe, the building sustained no injury.

That the direction of the electric discharge had, in this case, been determined by the gas-pipes which passed under the floor of the church, was evident from the fact that the watches of several members of the congregation who were seated in the vicinity of the gas mains were so strongly magnetised as to be rendered unserviceable.

The church at Crumpsall is about a mile distant from that at Kersal Moor, and the ignition of the gas by lightning, which undoubtedly caused its destruction, is not so distinctly traceable as it is in other cases which have come under my observation, because the evidences of the passage of the electric discharge have been obliterated by the fire. From information, however, communicated to me by the clerk in charge of the building, as to the arrangement of the gas-pipes, the most probable course of the electric discharge was ultimately found.

The church is provided with a copper lightning-conductor, which descends outside the spire and tower as far as the level of the roof. The conductor then enters a large iron down-spout, and thence is carried into the same drain as that in which the spout discharges itself. Immediately under the roof of the nave, and against the wall, a line of iron gas-pipe extended parallel with the horizontal lead gutter which conveyed the water from the roof to the iron spout in which the conductor was inclosed. This line of gas-piping, though not in use for some time previously to the fire, was in contact with the pipes connected with the meter in the vestry, where the fire originated, and was not more than 3 ft. distant from the lead gutter on the roof. As no indications of the electric discharge having taken place through the masonry were found, as in the case of the church at Kersal Moor, it seems highly probable that the lightning left the conductor at the point where the latter entered the iron spout, and by traversing the space between the leaden gutter and the line of gas-piping in the roof, found a more easy path to the earth by the gas-mains than was provided for it in the drain.

In my experiments on the electrical condition of the terrestrial globe * I have already directed attention to the powerful influence which lines of metal, extended in contact with moist ground, exercise in promoting the discharge of electric currents of comparatively low tension into the earth's substance, and also that the amount of the discharge from an electro-motor into the earth increases conjointly with the tension of the current and the length of the conductor extended in contact with the earth. It is not, therefore, surprising that atmospheric electricity, of a tension sufficient to strike through a stratum of air several hundred yards thick, should find an easier path to the earth by leaping from a lightning conductor through a few feet of air or stone to a great system of gas and water mains, extending in large towns for miles, than by the short line of metal extended in the ground which forms the usual termination of a lightning conductor.

It deserves to be noticed that in the cases of lightning discharge which I have cited the lightning conductors acted efficiently in protecting the buildings from damage of a mechanical nature, the trifling injury to the church tower at Kersal Moor being directly attributable to the presence of the gas-pipe in proximity to the conductor. Nor would there have been any danger from fire by the ignition of the gas if all the pipes used in the interior of the buildings had been made of iron or brass instead of lead; for all the cases of the ignition of gas by lightning which have come under my observation, have been brought about by the fusion of lead pipes in the line of discharge. The substitution of brass and iron, wherever lead is used in the construction of gas apparatus, would, however, be attended with great inconvenience and expense, and moreover, would not avert other dangers incident to the disruptive discharge from the conductor to the gas and water-pipes within a building. I have therefore recommended that in all cases where lightning conductors are attached to buildings, fitted up with gas and water pipes, the lower extremity of the lightning conductor should be bound in good metallic contact with one or other of such pipes outside the building. By attending to this precaution the disruptive discharge between the lightning conductor and the gas and water pipes is prevented, and the fusible metal pipes in the interior of the building are placed out of the influence of the lightning discharge.

Objections have been raised by some corporations to the establishment of metallic connexion between lightning conductors and gas mains, on the ground that damage might arise from ignition and explosion. These objections are most irrational, as gas will not ignite and explode unless mixed with atmospheric air, and the passage of lightning along continuous metallic conductors, will not ignite gas even when mixed with air. Moreover, in every case of the ignition of gas by lightning, the discharge is actually transmitted along the mains, such objections notwithstanding. A grave responsibility, therefore, rests upon those who, after introducing a source of danger into a building, raise obstacles to the adoption of measures for averting this danger.

* *Philosophical Magazine*, August, 1868.

LONDON AS IT IS, AND AS IT MIGHT BE.*

THE general aspect of the streets of London, even the principal ones, is commonplace, uninteresting, and even ugly; and, compared with the advantages gained, a very trifling expense would make an astonishing difference in this. What a difference, again, is there between London and Paris in this respect. There it is a pleasure in the best quarters to walk from one part of the city to the other: the fine broad boulevards, lined with trees, stretching in every direction; the fresh clear air; the white stone façades, rich with carving and sculpture; the tasteful shops, almost everywhere, make Paris the very pattern of a capital city. And this is my apology fer referring to it so often in this paper.

The effect to Londoners coming back from Paris to their own dirty city, with its long rows of uninteresting brick-built streets, typified by Gower-street; its monotonous squares; its filth and its smoke, is disheartening in the extreme; in fact, it is only through the principal thoroughfares, such as Oxford-street, Regent-street, or the Strand, where the shops and the throngs of people afford some amusement, that the pedestrian would care to loiter in London. Those of us who live within the town usually rush about from point to point by cab, underground railroad, or omnibus, our only thought being to get to our destination as soon as possible. Thus what might be a healthful exercise, becomes a fatiguing strain on the nerves.

I do not mean to say that there is not more solid and finer architecture in some parts of London than in Paris itself, such as the clubs about Pall-mall, the mansions round Hyde Park, and several great public buildings; and in the City, too, there are whole streets of architecture which, for boldness and originality, and solidity of construction, are far superior to Parisian. But it is all hidden in narrow streets and courts, and if you were to turn up your head to look at it, you would be carried away or knocked over by the rushing crowds below; in fact, the only time to be able to really see it is on Sundays, or on the early morning or late evening of a summer's day, when those busy millions have left off their toil for a time, and drawn off to the suburbs. But all the street architecture of London, with very few exceptions, is isolated from the surrounding buildings in style and character; and very often placed where it can hardly be seen at all to advantage.

Where the Parisians have the advantage of us is in the arrangement of their towns and streets. Nothing is hidden; all can be well seen, and nothing seems monotonous or devoid of interest. Now, it is a great reproach to us that Paris should be so beautiful and London so ugly. We cannot have and we do not want here a Napoleon and Baron Haussmann, to cleave lines of street right and left, regardless of cost, and indifferent to private interest; but we ought, at least, to do our very best to find out some way to remedy the evil. Is it possible to suggest some plan, for instance, by which a walk from University College to Oxford-street, down Gower-street, might be a pleasant stroll; or a walk along either the Edgware-road or Euston-road a pleasant or interesting one? Some will say we ought to build in white stone instead of brick. This may sound very well in theory; but it is impossible and out of the question. If London cannot be made to look interesting in brick and plaster, it is pretty certain that it will have to remain in its present ugliness, unless there be some revolution in our systems of leasehold and notions of economy. What we want is, to find some plan by which, without wholesale pulling down and building up, the existing London can be materially improved; and there are some improvements of this sort that seem to me to be obvious and easy of carrying out. The most important of these is a system of boulevards, lined with trees, in every direction, without, however, forming any new streets, or running to any great expense. No place could be more favourably circumstanced than London for constructing these useful and beautiful features of a large city. There are numerous, almost countless, broad roads in every quarter, of which I will take Euston-road or Pentonville-road as a familiar type, which has once been suburban, and have been lined in the main by private houses, with small gardens in front. As the town increases these roads become required for

* By Mr. Alexander Payne. See p. 40, *ante*.

shops, which are accordingly built out on the front gardens, one story high, and decorated on the top with all sorts of fantastic plaster casts, zinc-ware, &c., forming about as ugly a road as can well be imagined. Now, all that is wanted to turn these roads into magnificent boulevards would be to build the shops under the houses in the ordinary way, and to make use of the part now occupied by front gardens for wide foot-paths, bounded by trees. This might be attended with some expense in buying up the gardens; but this would be as nothing compared to the immense gain, which would entirely transform London into a new city; and it is highly probable that the property on each side of the roads would be so increased in value as to pay for the expense. Where there was much room to spare, as there would be in many cases, narrow gardens, with flower-beds and seats, might be formed under the trees; and where the underground railroad went underneath, shafts could be provided, by which that useful line would become less sulphurous and tunnel-like than at present.

It seems to me that, after clearing the air from smoke and dirt, the next urgent want is to introduce nature into London. We want nature's trees and flowers wherever we can find a place for them. The Embankment, with its gardens, and the beautiful flower-beds that have appeared of late years in the parks are steps in the right direction; but we want a great many more such steps. We want more public squares laid out as gardens, with fountains and seats. The parks are so far distant from one another that it is quite a journey to get at them; but if we had occasional public squares or gardens, however small, we could, in a long walk, put up with a dingy street or two for the sake of the gardens. I do not hesitate to say that it would be an immense gain to the occupiers of private squares themselves if they were all thrown open to the public; for instead of the privilege of paying a guinea or two for the right of entering one dingy square, and shutting everybody else out, they would have the right of entry into all for nothing; and they would also see hundreds enjoying a sniff of fresh air, and little healthy cheeks glowing, which but for that square would have been stived up in some pestiferous street, as they are now. This would be the way to educate the people, and do as much good as half a dozen British Museums. Why should not Leicester-square, for instance, be made a public garden? Is its present condition such a boon to its private owners or the neighbourhood that it cannot be given up? The lack of a place to sit down and rest your weary limbs is a terrible want in London, as at present. Let a stranger go down to the Embankment on a summer's day. He is, perhaps, tired, and wishes to sit down and watch the river; but there are no seats. Why on earth are there no seats along the Embankment? Happy thought,—he will go into the gardens across the road: his only view, it is true, will be the well-known ruinous brick buildings that uphold the architectural glory of London in this quarter; but, at least he can rest his weary limbs. He repairs to the garden, and he sees about five or six seats, each thickly studded with nursery-maids and children, who do not look as if they had the slightest intention of giving them up. A policeman, perhaps, tells him there are plenty of seats in Hyde Park; but, as he does not wish to walk three or four miles for a seat, he repairs either to the waiting-room of a railway-station or to some refreshment-room, where he purchases the luxury of a seat with a cup of coffee or a chop, which he does not want.

But, in the next place, we have many streets in London with and without shops which it would be impossible to turn into boulevards, and where we could not introduce trees or squares. Is there any way of improving this ordinary street architecture of London without pulling it down and rebuilding it. Most of our houses and shops have a facing of stone, stucco, or brick: those of stone are usually the aristocrats of the neighbourhood, of considerable architectural pretensions, and an example to the rest of the street: what is wanted is to "level up" the others (to use Mr. Disraeli's expression) to the same point. With regard to the stuccoed ones, I know of two examples, which prove that it is quite possible to make any ordinary brick house look artistic and interesting without facing it with stone or marble. I refer to Novello's music establishment in Berners-street, and to the confectioner's, in Oxford-street. Nothing could be plainer than the structural part of Novello's warehouse, which is simple brick and stucco, but is so tastefully decorated in patterns in colour as to afford as much pleasure as many an elaborate stone building; and the same system might, of course, be pursued with any stuccoed building. The confectioner's is more elaborate structurally than the other, but far the greater part of its ornaments are in colours. This seems to me to be an entirely new and useful field for architects;—given an ordinary stuccoed house—to make it look artistic and interesting; unless, indeed, we are to utterly despise stucco, and decline to stoop to house decoration of this sort as beneath our notice. If this be our line of action, we shall probably be deserted by the public, who will turn to engineers as a more useful body, and leave us to feed on the glory of our æsthetic ideas. I hold our true course to be to make the best of everything, even paint and stucco, and despise no materials that are given us to work with; and by so doing I think we shall follow in the footsteps of the best of our predecessors. But, if stucco can be decorated, what can we do with brick? A little while since, a prize was offered to gentlemen of this Association for the best design for the front of an ordinary Gower-street house, and in answer several very pretty designs were sent in; but, I believe, in every case the idea was to pull down the front and rebuild it; and the objection to this is that it is very certain very few, if any, of the people in Gower-street will pull down the fronts of their houses and rebuild. But how are they to be made artistic and interesting without pulling them down? I confess this question seems to me a poser. I cannot imagine one of these houses in Gower-street looking interesting without pulling down the front and rebuilding it. I can only suggest,—put some flower-trays in front of every window; put some large pots or boxes in basement area, and train creepers on trellises up the front if they will grow. Perhaps some one will be able to suggest a better way.

Time warns me I must pass on to my last point,—"That there is a want of general supervision in London from a fine-art point of view." Nothing is more striking in London than the utter confusion and want of plan in the place taken as a whole; it is more like a collection of towns than one town, and the streets wind about and bend here and there in a sort of fortuitous manner, as if their position were the result of chance. The rights of separate individuals everywhere seem to override the public advantage, and the same is apparent in the motley architectural character of the streets. One man has his warehouse or shop built in Classic; his neighbour adjoins thereto a Gothic building, without the slightest attempt to make it accord in any way with the former one. I think Regent-street is the only street of any architectural pretensions in London which has anything like similarity or unity of design about it; in other cases the only attempt seems to be to make each separate building look well *per se*, without considering whether it is in harmony with the rest of the street of which it forms a part. Another thing most noticeable in London is the number of untidy uglinesses which mar almost every view.

If any man carries on any business in a town which is offensive to the sense of smell or hearing you can prosecute him as a public nuisance; but he is allowed to offend against your more subtle sense of sight, by putting up some monstrosity which is a perpetual eyesore, with impunity. I must say this seems to me quite as great a nuisance as the other.

Let any one, for instance, examine the different views of London on the north side of the river from the various bridges or points along the Embankment; he will hardly find a single view which is not spoilt by one of these eyesores, which would not be tolerated for an instant in the best parts of a Continental city.

What was the use of the consummate art with which Wren designed the beautiful spirets of the City, in perfect harmony with his glorious masterpiece—St. Paul's,—so aptly termed the "mother and daughters of London," when every view is marred by the introduction of some factory chimney or huge gasometer, which might at least be banished to the other side of the river; or by such specimens of fine art as Charing-cross and Cannon-street Railway Stations?—the one adorned with a couple of sow's ears towards the river, and the other left in native ugliness.

I am sure I shall not be accused of exaggeration when I say that there are far more blots, blemishes, and general untidyness about views of London, and English cities generally, than Continental ones.

Are we to draw a deduction from this, that the English are naturally deficient in taste, as compared with other nations? This may be partly true, and the lack of unity of plan so discernible in English cities no doubt has its rise in that individuality and love of freedom which is one of the cardinal points of the English character; but I think more must be laid to the door of that strong current of Puritanism which has set in so strongly in Christendom for the last two centuries, and especially in England. If this age is anything, it is a utilitarian age. This, no doubt, is a virtue; but it has carried its utilitarianism so far as almost to despise beauty in its love for utility. Ornament of any sort, and all things beautiful, have been thought fit for Oriental and effeminate nations, or perhaps for the French, but quite beneath the notice of practical Englishmen. Fortunately for us, however, the love of beauty is a goddess and heavenly-born, and cannot be slain by any age, however fanatical,—not, at all events, while nature pays her such worship in her glorious architecture, where beauty and utility go hand in hand. Hence we see the strong reaction in favour of fine art that has undoubtedly set in. Large sums are annually spent at South Kensington and Schools of Art generally to educate the people in this important subject. So far so good; but surely the streets should not be allowed to counteract what is learnt at the School of Art.

There are several other points I should have liked to take up, in connexion with this subject, such as the desirability of providing accommodation in flats for all classes; and the advantage of building houses higher, with wider streets and openings between. At present very many quarters of London are taken up with numbers of small houses, designed for only one family, but generally occupied by two or three; but these things have been amply dealt with elsewhere, and they are such large subjects of themselves that it would be quite impossible for me to go into them this evening. I will therefore close my paper simply by recapitulating what has been said,—namely, that London is dirty, smoky; that its streets are monotonous and devoid of interest; that there is a lack of arrangement and fine-art supervision; that it might become clean; that its air might be purified, and much of the smoke prevented; that the character of its streets might be entirely altered, by formation of boulevards and other improvements; and that, under proper supervision from competent persons, its blemishes might be gradually removed, and it might become one of the grandest and finest, if not the grandest, city of the world, instead of one of the dingiest; and my hope that it may and will become so must form my apology for taking up the time of the Association with a paper on "London as it is and as it might be."

In the discussion which followed the reading of this paper at the Architectural Association, Mr. Blashill said he was afraid London could hardly be expected, as things stood, to be a clean place, even in the well-attended-to thoroughfares. It was a place of business of very heavy traffic, and looked upon as such by the influential people who belong to it. The English people, with power of choice, had not been a town-loving people, as our neighbours the Parisians are, for example; and this difference of sentiment had hitherto affected, and will continue to affect the question. No one, however, disputes that improvements may be usefully made. The City, for instance, seems likely to undertake the cleansing of footways within its jurisdiction; doubtless to be followed by other similar changes. As to the chimney-cowls, he was afraid that Continental cities were as badly off as ourselves. In a recent visit to Geneva, he had noticed that a chimney without its contorted piece of zinc was an exception. He was afraid Englishmen would never submit with any pleasure to dictation as to the appearance of their freehold houses; he for his part thought that attempts at uniformity in London streets were pretty generally failures, destroying the picturesque and individual character so much to be wished for, and unluckily dictating more often than not a by no means pleasing type of building for unmeaning repetition.

Mr. G. Herbert West said that one point with reference to works carried on in Paris necessary to be noted in any comparison with London was sometimes overlooked. People did not consider that the continuance of the Paris of Louis Phi-

lippe's time had become impossible; it was then a fortified city of the Middle Ages, with some modifications; change was absolutely necessary in order to open up the city and fit the communications to the traffic. Visitors to Paris saw what appeared on the surface; but those who knew it thoroughly, from living there and from long special investigation, did not feel inclined to compare it with London as in every respect superior. The main thoroughfares certainly are kept clean; but the back streets, with their narrow pavements, 1 ft. 6 in. to 2 ft. 6 in. across, and wide mud-filled gutters, are very bad; in these places Paris beats London hollow in bad weather. Again, in Paris, the street mud is washed into the sewers, a course hardly possible in those of London, which, in fact, convey little but water. Paris yet retains the cesspools that London has to a large extent got rid of, as is evident to the nose in walking in the streets after eleven o'clock at night,—perhaps the worst evil of the two. Asphalte roads, with proper attention, may be kept clean with less difficulty than granite or macadam; but the at times dangerous slipperiness,—the impossibility of stopping in any reasonable distance a vehicle driven at a fair pace,—is a drawback felt much at Paris, as no doubt it will be here, unless in some way avoided. The old regulation in Paris that houses should be cleaned once in every ten years, might be applied to London. A jet of steam and water were used for some time, with the effect of removing about one-eighth inch of stone on each occasion. The custom now seems to be to use a sort of hearth-stoning process, and soap and water. He called attention to the portico of the Athenæum Club-house as a sample of work in London cleansed at intervals; the process pursued was, he believed, to rework all faces and mouldings, a method that must be stopped at some time. As to the smoke in Paris, it certainly was less than in London, in consequence of the different habits of the people. For 6,000 or 7,000 francs a year, an apartment would be rented containing a couple of reception-rooms, one not large bedroom, two smaller, and a kitchen; of course the accommodation for such a rental in London would be much larger, but the French have smaller families than the English, and with the smaller number of rooms fewer fires for warmth are required. For cooking, charcoal in a pan, put out when done with, is the substitute for the kitchen fire in England. Coal is burnt much more now than formerly, but wood always by preference; the ashes are habitually heaped up at the back, maintaining a fire at once economical and producing little smoke. Up to the 1st of January, 1860, when the fortifications were made the municipal boundary, instead of the octroi wall of 1784, as formerly, the city of Paris contained hardly any manufactories; and, since 1860, many have been removed, in order to avoid the octroi; thus their smoke and fumes are kept away. On the question of general aspect he could say but little for London,—it perhaps deserved all that had been said of it; but he could not praise new Paris without reserve: after a time the regularity, the long level lines of cornices, the repetition without ceasing of similar features, coupled with painfully bad masonic construction, all tended to make even the most favourable critic heartily sick of the whole,—as a mass of pretentious mediocrity, for which had been destroyed too many of the features of the city, that, of all modern cities, possessed at one time the most noteworthy collection of sites and buildings,—lodged in the minds of all cultured people for their historical or intrinsic interest. The site of the Hôtel de la Trémouille, one of the most splendid works of the fourteenth century, is all that the inquirer after such buildings finds now. The passion for perfectly straight streets became, a while ago, a perfect mania; the Hôtel de Cluny was, it is true, saved by a *détour*,—a rare example; buildings newly illustrated in books five years before are now almost forgotten altogether. The process so thoroughly carried on in Paris could not be looked, perhaps not wished, for in London;—a personal, almost uncontrolled, direction of finances and public works like that of Baron Haussmann would not be allowed. The Prefect of the Seine, named directly by the Emperor, chosé, subject to the Emperor's approval, the members of the municipal commission. The financial questions may be illustrated by the fact that the ordinary receipts of the city from 1852 to 1869,—from octroi, centimes communaux, estates, markets, &c.,—amounted to 40,000,000*l*. The outlay on works in the annexation and new parts of Paris has been 14,000,000*l*.; of the works in old Paris, 18,680,000*l*.; of the extraordinary works (the large new streets, &c.), 52,000,000*l*.; making in all, 85,000,000*l*. In 1864, Baron Haussmann ceased to ask aid from the State; the Central Office of Works began the issue of bonds, which gave an available income of from 4,000,000*l*. to 6,000,000*l*., subject to the yearly consent of the Corps Législatif. This, however, was not found sufficient, and the new streets were mortgaged to contractors as they were made, and also the future income of the city. The law of expropriation, pressed well into the service by Baron Haussmann, gave his autocratic power still more scope. He had the power of taking all the property required for a new street, and a great space on either side of it. Formerly (by the law of 1841) the Corps Législatif decided on the question of "Public Utility;" but after the decree of 1852 this was decided by the Emperor alone. These few facts, and many more could be cited with the same tendency, would illustrate the arguments that might be used to show that Paris, and the public works there, in the views at least of Englishmen, might fairly perhaps be spoken of with less thorough respect, both as to the works themselves and some of the processes of effecting them, than was the almost universal custom.

DOINGS IN EDINBURGH.

THERE is not much appearance of activity in the building trade here at present. The demand for private residences has fallen short of the supply; and the other works on hand are few, and of no great magnitude; but there is a good prospect of a considerable number of important works being inaugurated in the course of the year.

The Gilmore-place Free Church is being roofed in; but the tower is still incomplete. Mr. Pilkington has in this instance refrained from freaks and eccentricities: there is a breadth and masculine simplicity about this church much more satisfactory than the restless efforts at originality which characterised his former works.

An Independent Church at Caledonian Crescent, Dalry, is nearly completed. It is the first effort of Mr. Alexander Heron. Funds do not seem to have been plentiful, and the building appears somewhat weak and superficial. The outline of the spire is far from pleasing. It would have been better had that feature been dispensed with, and more depth and solidity imparted to the body of the church.

The foundations for the new Infirmary have been taken out, and building operations will be commenced forthwith. This building will be of considerable magnitude, and the ultimate cost is estimated at about 200,000*l*.

The line of new thoroughfare from the Waverley Station to Canongate, to be known as Jeffery-street, is nearly cleared out. In this street the long-delayed Trinity College Church is to be built. The plans have been prepared by Mr. Lessels, after the style of the ancient edifice, which was erased to make way for the extension of the North British Railway Terminus. The building will be oblong in form, having a tower and spire rising to the height of 115 ft. at one angle of the main gable, and a turret starting from the ground, and roofed with stone, at the other. The chief doorway is a reproduction of that in the transept of the original, and the window above is from the same source.

The apse and two bays of the original choir, together with the clearstory and vaulted roof, will be re-erected at the rear of the new portion, to serve as a hall for congregational purposes. It is to be placed diagonally to the church proper, from which it will be separated by an ornamental wooden screen, the upper portion of the two arches being left open. The interior of the church itself will be of a common-place description, with galleries supported by iron columns ranging round three sides of it.

Another new church is talked of as being likely to be erected in Chambers-street, the new thoroughfare to the north of the college. In the formation of this street it was found necessary to demolish the School of Arts, and a new and superior building, designed by Mr. David Rhind, is to be erected, at a cost of 8,000*l*., upon a site to the west of that occupied by the premises which have been erased. At the east end of this street it is proposed to erect a hall for the use of the University, to be dedicated to Sir Walter Scott; and a scheme for a new theatre in the same locality has been mooted. A movement has been set on foot to have a town-hall, which is greatly needed in this city; it may also form one of the group of public buildings in this locality. Altogether Chambers-street is likely to be the centre of attraction in the old town.

The new Waverley Bridge is being actively pushed on, and when it is completed the new station will be proceeded with. This is a very desirable improvement, for the existing station is in every respect quite unworthy of the city. As the large piers of the North Bridge interfere greatly with the platform arrangement, it has been proposed to substitute an iron girder bridge for the stone one, but funds are not forthcoming. At'all events, the roadway of the bridge is to be widened, and, if a new bridge be not constructed, this is to be done by throwing out projecting footpaths on either side, and adding the present footpaths to the driftway.

The trustees under the Walker bequest have at a late meeting set aside 45,000*l*. for building the new cathedral. In this sum the cost of an organ, stained-glass windows, peal of bells, &c., is not included, so that it is not improbable that the ultimate expenditure may be double that sum. Six architects,—three from each side of the border,—have been invited to submit designs. The competing architects are Messrs. Scott, Street, and Burges; Messrs. Peddie & Kinnear, and Lessels, of Edinburgh, and Mr. Ross, Inverness. We trust that this competition may lead to a more satisfactory result than has been the case in some recent instances of a like nature. A complete scheme for the allocution of the remaining part of the trust funds, which are to be employed in erecting and endowing additional churches, has been agreed upon, but it has been thought desirable, before taking further steps, to have the opinion of counsel upon certain doubtful points.

The Union Bank of Scotland have acquired an extensive frontage in George-street with the view of building new premises there, which, it is said, are intended to equal if not to surpass in grandeur the other banks in this city; and probably no city in the world can show such an array of palatial edifices devoted to this purpose. Mr. David Bryce is, we believe, likely to be employed as architect.

Rumour has it that a new insurance office is to be erected at the angle of St. Andrew-street and Register-street, an excellent site for architectural effect.

The Tramway Company are anxious to push on the remaining portions of the line of rails, but they are not at one with the local authority. The steep gradients in many parts of the city have proved obstacles to the satisfactory working of the tramways; during the existence of hard frost it was with great difficulty that the large carriages were drawn up Leith-street, even with the aid of extra horses: lighter cars should be provided.

THE DUKE OF EDINBURGH'S COLLECTION, SOUTH KENSINGTON.

HIS Royal Highness the Duke of Edinburgh has obligingly sent to the South Kensington Museum the drawings made in illustration of his cruise round the world in the *Galatea*, by Mr. Brierly and Mr. Chevalier, together with selections from the objects of science, art, and curiosity collected in the course of it. The catalogue which has been prepared shows that there are 37 sketches by Mr. Brierly, 96 drawings by Mr. Chevalier (both the artists have done their work well), and 784 objects in the general exhibition. The collection, as a whole, is full of interest, regarded from many points. Some will be struck with the evidence it affords of the eager kindness with which the Queen's son was received throughout the colonies and dependencies of the empire; others will regard it as a valuable indication of the disposition and tastes of the owner, and of his consideration for the general pleasure; those who look closer will see that it affords many important lessons to our own people; while all will find it an interesting exhibition of things curious and beautiful. It has been well set forth by Mr. T. Clack and Mr. C. Townshend, of the Department; the birds, of which there are two grand cases, were arranged by Mr. Ward, the naturalist; and the arms, a beautiful collection, are shown in the shape of trophies, at the suggestion of the Duke himself, Messrs. Wilkinson & Co., of Pall Mall, assisting. Some of these arms present exquisite specimens of enamelling, metal chasing, mechanical ingenuity, and coloured decoration.

The articles from Japan include works in bronze, black and gold lacquer, and textile fabrics, unapproachable in this country. Notice, for example, the bronze incense-burner in three stages, given to the Duke by the Mikado (102); the box, of black and gold lacquer, containing various games (559); and the remarkable dress of blue crape representing the sky, and gradating downwards to a sedgy landscape at bottom, with birds flying. However, we have no intention now of pointing to all that is noticeable in the exhibition; our object is to send our readers to study it for themselves. We will only add that the collection of gold and silver trowels, jewelled and mother-o'-pearl'd and malachited, with which first stones of public buildings were laid in our colonies, is a marvel; and in viewing the engrossed addresses that chronicle the events the expert will notice with surprise the skill with which some of them are illuminated.

ALTAR VESSELS FOR ST. PAUL'S CATHEDRAL.

IN 1810 the altar-plate belonging to St. Paul's Cathedral was stolen, and from that time to this copper gilt vessels have been used. At the cost of several persons, silver gilt vessels have now been prepared by Messrs. Lias & Son, of Salisbury-court, Fleet-street;—a large flagon, the gift of the Rev. W. J. Hall; two chalices and patens, presented by the Rev. W. Sparrow Simpson, F.S.A., who has taken particular interest in the work; other chalices and patens given by Miss Hale and Mrs. Melvill; and a large and costly alms-dish, presented by Mr. Joshua W. Butterworth, F.S.A., in memory of his late father; some of the other gifts, we should say, are also *in memoriam*. The flagon ("16¾ in. high, chased with wheat and grapes, relieved by bright flutes, in the style of the Renaissance; the body enriched with six medallions, containing the symbols of the Passion—the Cross, the Agnus Dei, the Scourge, the three Nails, the Crown of Thorns, and the Sponge and Spear; the foot ornamented to correspond with the body, with six medallions, containing the sacred monogram, the Chi-Rho, the open scroll, the pelican, the arms of the cathedral, and the crest of the donor") and the chalices are handsome and appropriate: the art a little weak, but the manufacture very good.

By far the most important production is Mr. Butterworth's .Alms-dish, which is 2 ft. 3 in. in diameter. The centre subject is after Raffaelle's cartoon, St. Paul preaching at Athens, chased in high relief; the border being after a guilloche in the chancel of the cathedral, with medallions containing scenes in the life of St. Paul:—1. St. Paul healed by Ananias. 2. St. Paul healing a cripple. 3. St. Paul raising Eutychus. 4. St. Paul before Agrippa. 5. St. Paul at Melita; and the arms of the donor. The work is *repoussé*. The least satisfactory parts of the central subject, are the head of Paul, and the circular temple in the background. The right-hand side of the latter is so messed by the modeller, that it ought certainly to be altered before this otherwise fine dish be transmitted to its destination.*

NOTTINGHAM SCHOOL OF ART.

THE annual distribution of prizes in connexion with this school has taken place in the Exchange Hall. The Mayor (Mr. W. G. Ward) presided, and there was a large attendance.

A letter from Mr. Cole, of the Science and Art Department, who was to have presided himself, was read, in which

"he congratulated the town of Nottingham on possessing one of the very best Schools of Art in the country; and also said:—The town must adopt further measures for maintaining this position and extending the influence and advantages of further art-education, by the establishment of a Museum of Science and Art especially illustrative of those industries which have given Nottingham the eminent position it holds among the great manufacturing centres of the United Kingdom. . . . The School of Art already possesses suitable space for the commencement of such a museum. . . . The municipal authorities must incur the liability for the cost of watching, cleaning, and lighting the museum; and if this be done, Nottingham, within a few weeks from this time, might have a South Kensington Museum in its town, open daily, and for three evenings a week for the instruction and ennobling recreation of all classes. I say 'liability,' because the fees for admission on three days in the week would certainly yield some revenue. This revenue might be made adequate for all purposes without, perhaps, drawing upon the rates, if the gentry and the manufacturers of the town would take a sufficient number of annual tickets of admission for the students' day, say at 15s. and 10s."

The mayor, in reading this part of the Report, said he could not sit down without bearing his testimony to the able services rendered by their excellent head master, Mr. Rawle. From the Report, it appeared that,—

"In the annual Government examination, held last May, the Nottingham school again headed the list, making the fourth consecutive year that Nottingham has gained the highest number of prizes among all provincial schools. In May last, however, the school took a much higher place, having not only beaten all provincial schools, but all the London schools, taking two more prizes than were taken at the National Art Training Schools, South Kensington Museum. In the prize bonus awards to art-masters this year Nottingham has taken the highest prize among all provincial schools. The first two prizes were taken by London schools; then the next eight were in the following order:—Nottingham, Manchester, Edinburgh, West London, Birmingham, Salisbury, Sheffield, and Glasgow. During the four years that bonuses have been given to head masters, it will show how evenly Nottingham had done its work when they found that in that time the master of the Nottingham school had taken 170*l.* in prizes, or 20*l.* more than any other school in the kingdom, including the London schools."

Mr. Bowler and the head-master also addressed the meeting. The latter said:—

"It has ever been a source of regret to me that employers of labour and artizans generally do not feel more alive to the necessity and importance of a more widely-spread art-education. The race for pre-eminence between certain nationalities is now a very close one, and if we do not brace ourselves up for the contest, we shall perhaps, by-and-by, find that the laurels of success have been won by others. We are now enjoying unparalleled prosperity, and yet, as a nation, we are doing far less for art than our position and means would justly entitle us to do. True, the country has one thing to be proud of, and that is the existence of that palace of art-treasures, the South Kensington Museum; and for the possession of which we are so deeply indebted to Mr. Cole, for it is in a very great measure owing to his efforts that the museum holds the proud position which it does. But we need more than that; the country should aid the action of the Science and Art Department still further, and not only give ungrudgingly all that is necessary for the completion of that museum, but also give with a bounteous hand for the purpose of erecting a young South Kensington Museum in each of our great provincial towns, that the seeds of art and refinement might be sown in many a soil now comparatively barren."

TRAVELLING IN RUSSIA.

COL. RICHARDSON GARDINER, whose handsome offer in respect of the one-day-to-be-raised-statue of Shakspeare we had occasion to mention some time ago, has sent us notes of a journey recently made by him to the Russian capital, which will doubless interest some of our readers:—

"At eleven p.m. we took our places from Berlin to St. Petersburg,—two nights' and two days' travel. Let us look about us and see what our arrangements are. L. and I have a double compartment-carriage, each opening out into the other by a door between; the one making up into beds for the night, and the other forming our compartment for day, all heated most genially by hot-water pipes laid on from the engine boiler. Good. Our commissionnaire, whom we sent to engage this extra comfort for us, carried out his instructions well. Our companions have a large saloon carriage, heated by a wood-burning stove, and all of them are seated round it smoking their cigars.

Now, I have no doubt hundreds of English railway directors have travelled on these German lines, and if they are not deprived of the means of observation they must have noticed many little things,—small in their way,—but calculated to be of great service and convenience to railway travellers, which they might have very easily introduced on their own railways. *Here's one:*—In this North Prussian carriage there is a pasteboard card, about 1 ft. square, headed 'Fahrplenmässige" (travelling plan regulations), and underneath, 'Aufenthaltszeiten' (stopping times), and it proceeds to give you, for the train you are in, its time of arrival at the stations, time of departure, difference carried out in another column as stopping time, and all times between six p.m. and six a.m., have a blue shade painted across them, leaving them quite legible, but not ended to show you that those are night times, without adding the p.m. or a.m., which sometimes carried through two or three days and nights, confuses you. It is well known that the Jews begin their day at six a.m., and their night at six p.m., each lasting twelve hours. The recurrence to this old mode of dividing the day and night, and the darkening of the hours indicating the latter, is a great improvement on our railway time-tables. On *another* side you are informed where there is to be a *table d'hôte*, and other species of refreshment, what are the 'Schlafvorrichlungen,' or sleeping arrangements in the carriages, and the 'Zollabfertigung,' or revision of luggage in the custom-houses, besides other information valuable to the traveller on the line.

Here we are at Dirschou, a town in ancient Poland, and crossing the frozen Vistula, a river familiar to my school days, and now we are going over its magnificent bridge, half a mile long, leaving Dantzig on our left, where the deals come from; and now we look out for Marienburg, and its Palace of the Ancient Grand Masters of the Teutonic Order, who nearly had their own house about their ears on one occasion when they were besieged in it. The *Meisters Remter*, or chapter-house of the order, in which assemblies of the order were held and foreign ambassadors received, for they were great Swells in those times, rests on a *single* pillar of granite in the centre. The Poles, while besieging the city in 1410, endeavoured to aim a cannon ball so as to shoot away this pillar, and overwhelm at one blow beneath the ruins, the Grand Master and all his Knights, whom they knew from information of a deserter, to be at the time assembled in conclave. *The ball missed its aim, but lodged in a corner of the chimney, where it still remains.*

Königsberg, once the capital of Prussia-proper, and *now* third city in the Prussian dominions. There in the *Schlosskirche*, Frederick, Elector of Brandenburg, in 1701, placed the Crown on his own head, assuming the title of Frederick I., King of Prussia, just as the present King William of Prussia, and now Emperor of Germany, is reported to have done when he came to the Throne, and coronetted himself by the Divine will, following the example of his ancestor. I am informed there is a considerable quantity of amber found all along the coast near Königsberg, and this is how they get it. The high winds throw up a vast accumulation of sea weed. The amber-fishers go up to their necks, provided with nets, by which they draw the weeds to land. The amber occurs in the lower beds of the sea sand extending under the Baltic, and when the storms bear up the amber earth, the amber is carried to the surface.

My observation (limited, certainly, but, as far as it goes, trustworthy) is that the Russians are beginning to be jealous of the Prussians and their late doings, as the Prussians seem to be giving themselves 'airs' everywhere, which creates an antagonistic feeling in the persons 'aired,' and is not calculated to inspire them with a peaceful feeling towards their 'airers';—so do not let us be so sure that the French people and the French press are insane in imagining that some day or other the Russians and French may become allies; but here is the *bonâ-fide* frontier at last, and we step out on Russian soil at Wierzbolow. Bravo, you Russian Tartars! I like the look of you! 'Good buffet, and plenty of time for refreshment!' 'Change carriages; passports and luggage examined.' All right; we have only nine large portmanteaus and boxes in the van, and twelve little parcels in the carriage, which have altogether cost to St. Petersburg a mere trifle of 18*l.* or so in excess of the allowance. I would not be so mean as to say that L. has had anything to do with this *limited* 'baggage'; however, business first and pleasure afterwards, so we at once go about our luggage. Before I go into that buffet, I will perform my first duty towards the Russians, by suggesting to any English custom-house officer, that *here*, in what our true-born Briton might call an outlandish place, he would learn a good lesson as to how his duty ought to be performed. First of all, everything in Russia is colossal and yet convenient, and we find that in a spacious *douane*, surrounded by a circular counter, numbered in divisions, without any hurry, bustle, or confusion, all our luggage is taken by the porters to a certain definite place, corresponding in duplicate to our numbered register-ticket; there the van luggage is deposited, and to the same place all the small parcels find their way; the officer on duty specifies to his *douaniers* what his requirements are, and, finding that we are a party of British subjects travelling for pleasure and not for trade, he deals most gently with our wardrobes, barely regarding even some new ball-dresses, which L. had had separately packed by the milliner, fresh from her establishment, in large deal boxes.

In to the 'refreshmenting department,' as poor Charles Dickens called it, and found there yet another example for our English 'Mugby Junction.' Half a dozen hot viands to choose from, accompanied by soup, coffee, or wine, and all of the best quality and description, served at a moment's notice, on table-cloths white as snow, with most attentive and respectful waiters; add

* Since this was written, we have been informed by Messrs. Lias that, recognising the correctness of the objection we took on examining the work, the parts in question will be altered,—a determination very creditable to them.

to this lavatories, with the requisite accompaniments of soap, towels, &c., and I leave you to judge of what has been talked about as barbarous Russia. Here we are, on our first introduction at a frontier station, finding more civilisation than has happened to my lot in many an old country through which I have travelled.

Wierzbolow, I find, is 560 miles from the capital, where we shall arrive to-morrow evening: so we are beginning to be near the end. And now time is up, and we must get ourselves into Russian railway quarters for the first time. Now let me next make a survey of a first-class railway carriage: here it is before me, and it appears to be something entirely novel. It has two ends and a middle. Well, so have most things; but how are they arranged? At each end there is a compartment for, say, five sitters, but comfortably containing only three passengers, and the middle has four small square compartments (two on each side of the centre passage), large enough for one comfortably to curl up and sleep in, although evidently intended for more. Well, now outside, just in advance of the end compartments, there are doors by which you enter a cross passage, leading to a centre passage, which leads to your respective departments, so that by taking for L., her maid, and myself, one end compartment, and the others taking unto themselves the four centre small compartments, we leave the other end for stray passengers on the way, or others getting in at Wierzbolow. There are two stoves, one of which is fixed in the interior division of each of the end departments, so that half the stove is in the carriage, and the other half in the cross passage, and as the temperature was about 70° Fahr. on entering, we began to think we should not, at all events, suffer from cold on our journey.

If you can follow this plan you will perceive that our party were all, as it were, together under one roof, and that we could pay each other visits in our respective cabins, as our lumbering, old, rolling, but still comfortable carriage, put me much in mind of a steamer of the olden time; and its wheels, as they rolled over the frozen rails, sounded just like the paddles beating against the waves.

We strongly objected to be stifled with heat in Russia, where we had expected to have met our fate by frost, and I addressed myself to the 'storekeeper,' who accompanies every first-class carriage, to reduce it by machinery which they have for that purpose: so I 'unearthed' our Russian fireman from a corner of the cross-passage, in which he had doubled himself up for a nap; and now began a series of amusing signs and symbols, which continued, with varied intermission, between this interesting old man and myself during the next twenty-four hours of our journey. He was a character in his way, and seemed to be a Russian originally from the far interior of Siberia, of the Tartar race,—brawny and muscular, with high cheek-bones, small bright eyes, terribly shaggy hair, and a face as broad as it was long,—a complete parallelogram. We soon got friends after arranging the stove.

550 miles from St. Petersburg, at 'Kowno,' where, on the 22nd June, 1812, the French army crossed the Niemen on their advance to Moscow, and some rising ground on the opposite bank is still called Napoleon's hill. The town of Kowno was occupied by a large *corps d'armée*, and suffered considerably. The remnants of the army recrossed the river at the same spot on the 13th December, in a very bad state of discipline. There is a monument existing commemorating this retreat, and bearing the following inscription in Russian, which, translated, is as follows:—'In 1812 Russia was invaded by an army numbering 700,000 men. The army recrossed the frontier numbering 70,000!'

441 miles from St. Petersburg, at 'Wilna,' occupied by the French on the 28th of June, 1812. It had been evacuated by the Russians during the night. The Emperor Napoleon occupied in the Episcopal Palace the rooms which the Emperor Alexander had left the previous day. The country all along here is covered with snow, so I cannot form an idea as to its cultivation; but the villages are few and far between, and those do not exhibit any high degree of prosperity. They are mostly composed of wood, somewhat resembling, only in a poorer degree, the Swiss mountain chalets. Birds are scarce, not liking, probably, to face the deep snow. We have only seen two magpies for miles; but as the old couplet says, one magpie is sorrow, two mirth, three a wedding, and four a birth.

Between stations separated by long distances, we amuse ourselves with the contents of the picnic-basket, and having Liebig's essence and Fortnum & Mason's compressed beef tea, with other delicacies, our Etna boils up some water, and we get a capital entertainment in the Swiss Family Robinson style. Our cabins are now kept by our old friend at a delicious temperature; but when we issue forth at a station, we all don our complete suits of furs, as the air is nipping cold, but full of oxygen and ozone, as the country is overlaid for hundreds, and even thousands, of miles with its wintry covering of snow, and we are warned by a notice not to put our heads out of the little window of our cabin, which is only 1 ft. square, as '*Cette imprudence pourait avoir des consequénces graves.*' But with our shubas, caps, boots, and gloves, it would be impossible even to feel a shiver with many more degrees of frost than we have had yet.

We get most delicious coffee at the buffets, and still more delicious tea, served in tumblers for the gentlemen, and cups for the ladies, with milk that the Russians are not yet sufficiently civilised to adulterate with unwholesome materials; and notice is given you of the starting of the train by three bells first pealing outside the station, and repeated by an official at the refreshment-room door, rung successively at intervals of a few minutes,—the first, a notice; the second, a warning; and the third, we're off. All along the line the men live in wood huts, which are all numbered outside with white paint, starting from the capital, so you can count off your approximation to the end of your journey as you get along. And now the numbers are gradually diminishing, until, at length, St. Petersburg bursts upon our view, with its colossal public buildings, its gorgeous palaces, churches with gilded cupolas, and sleighs with fast-trotting horses are awaiting us, into which we get with alacrity, leaving our luggage to the commissionnaire of the hotel to bring after us, and drive off at the rate of twelve miles an hour over the frozen snow to the Hôtel de Russie, where we find, as we ordered by telegram, warm baths, comfortably-heated rooms, a dinner *à la Russie*, all awaiting our kind attention."

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET, BLOOMSBURY.

THE Hospital for Sick Children, now about to be rebuilt, from the designs of Mr. Edward M. Barry, R.A., occupies a site of historic interest, and is peculiarly appropriate for a medical charity. The old house was the dwelling of Dr. Meade, the courtly Court physician, the Mæcenas of the men of letters of his day, and that of Addison, himself a wit, as well as a doctor of great repute, whose name, however, lives in Sir C. Hanbury Williams's line,—

"Health waits on Meade's prescriptions still,"

as much as, or perhaps more, than in his medical works, now seldom read, although well worth the reading.

The house had a spacious garden twenty years ago, well furnished with shrubs and fruit-trees. The vines bore grapes, and the large hothouse was still standing when the new era in the history of the place began. The marble-flagged dairy exists still. The stables opened to the fields, and less than 100 years ago the horseman could mount and ride through green lanes all the way to Highgate, whose village steeple still forms the most striking object seen from the upper windows.

Bit by bit the old house has put on a soberer dress as it has longer served its present purpose. The gilded cornices have been distempered, the pictured panels of flowers and shepherdesses have been exchanged for a modest grey; but yet an incongruity has been unavoidable between the style of the building and its uses; for it has not grown fitter for its present purpose in the same proportion as it has lost its old quaint beauty. Deep cornices collect dust; wooden and painted walls are difficult to clean; warming and ventilation are hard to carry out properly; and, worse than all, a life of 170 years tells upon houses just as the customary three score years and ten do upon man. And so, with ever-increasing demands from the poor, which are not nearly met by the increase of beds from twelve to seventy-five, and with the constant need of yearly repairs, to keep the old hospital even habitable, the committee have determined to rebuild by degrees, as means are afforded them by the generosity of the public.

That which it is now proposed to build is the central block, which will contain most of the offices, the dispensary, operating theatre, chapel, and arrangements for the extensive out-patient department, on the basement-floor; and this plan has the great advantage of leaving the existing buildings almost completely undisturbed, and so of allowing the internal working of the hospital to go on without interruption.

Had the site been a larger one, the arrangement would in many respects have been different, and the problem to be solved by the architect much easier.

Before describing the details of the building, a few peculiarities may be mentioned as required in a children's hospital, which would be less necessary in a hospital for adults.

First. The out-patient accommodation needs to be more extensive and more complete in a hospital for children, because each patient requires a grown person to take charge of him, which, even if two or three should be brought by the same adult, the increased risk of confusion more than makes up for the saving in space occupied. Hence the need for special arrangements to prevent crowding, and to avoid the meeting of a double current of patients.

Secondly. Considering the liability of children to some forms of contagious illness, it becomes necessary to provide a separate waiting-room for patients on their first application, in order that as they come they may be immediately inspected by one of the medical officers, and thus will contagious ailments be separated from the others, who will be at once sent to one or other of the two large waiting-rooms, according to the physician or surgeon under whose care they are to be placed.

Thirdly. In connexion with the wards themselves, in addition to the bath-room and water-closets which are needed in all hospitals alike, it is very important to provide a ward-kitchen, where milk, beef-tea, and the various little articles of food so much needed for children can be kept in readiness day and night without the necessity of sending to the kitchen. It is also necessary to provide a vestiary in connexion with each ward, in which not only the ward linen, but also the children's own clothes can be kept, so as to secure perfect neatness and order.

It will be observed that there are no nurses' rooms in communication with the wards, because in children's wards nurses when present are always on duty; while they take their meals in a common room, and sleep away from the wards. The allowance of cubic space to each patient in the wards is in no case less than 1,000 ft.

The small separate wards speak for themselves, as being needed for special cases, while the quarantine ward at one end of the north wing is intended for the reception of cases of doubtful illness until the question of their nature is answered, when they will either be removed to the adjacent but detached fever ward not yet erected, or be restored to the general wards of the hospital.

The centre portion of the building in Powis-place is now in progress.

The out-patients' baths, the special arrangements for convalescents, and many obvious wants, are intended to be supplied, as shown in the plan, as soon as funds enable the committee to pull down and rebuild the two houses, 48 and 49, Great Ormond-street, which, as already said, are left for the present untouched.

Mr. John Walter, M.P., always ready for a good work, has consented to preside at a dinner in aid of the funds of this Institution, on the 7th of next month, and will, we hope, be well supported in his appeal for help.

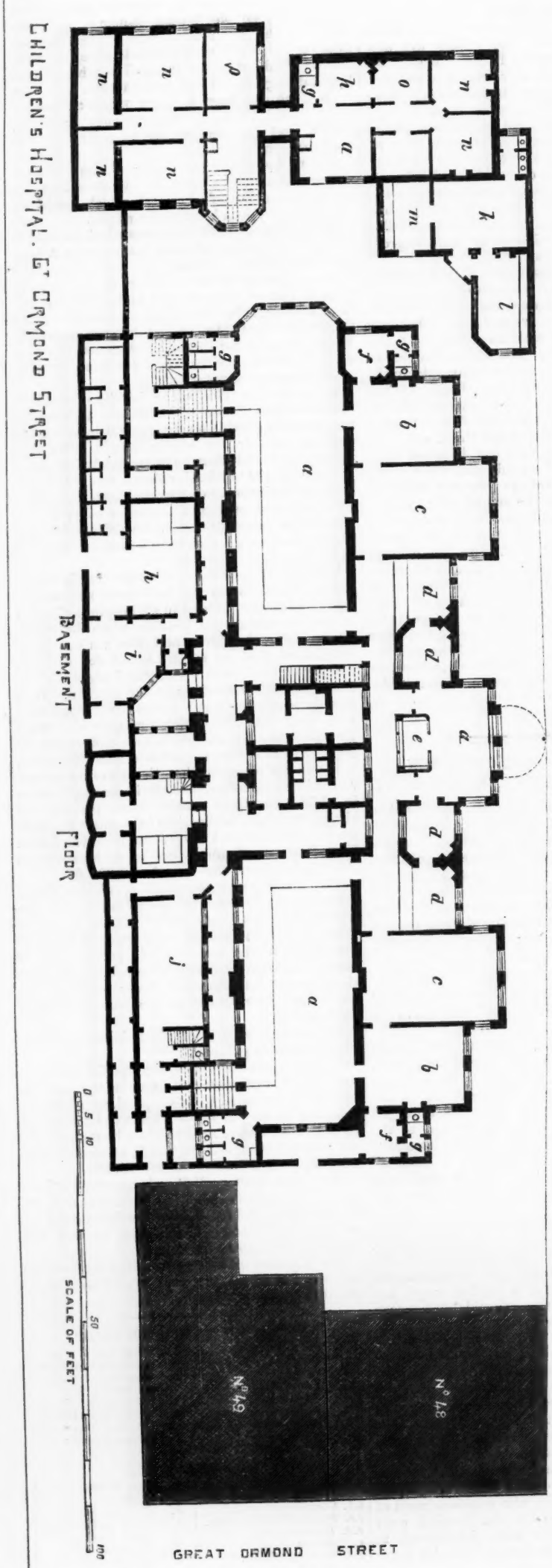
The Princess of Wales has visited the hospital, and has sent presents of toys, &c., as have others of the Royal Princesses.

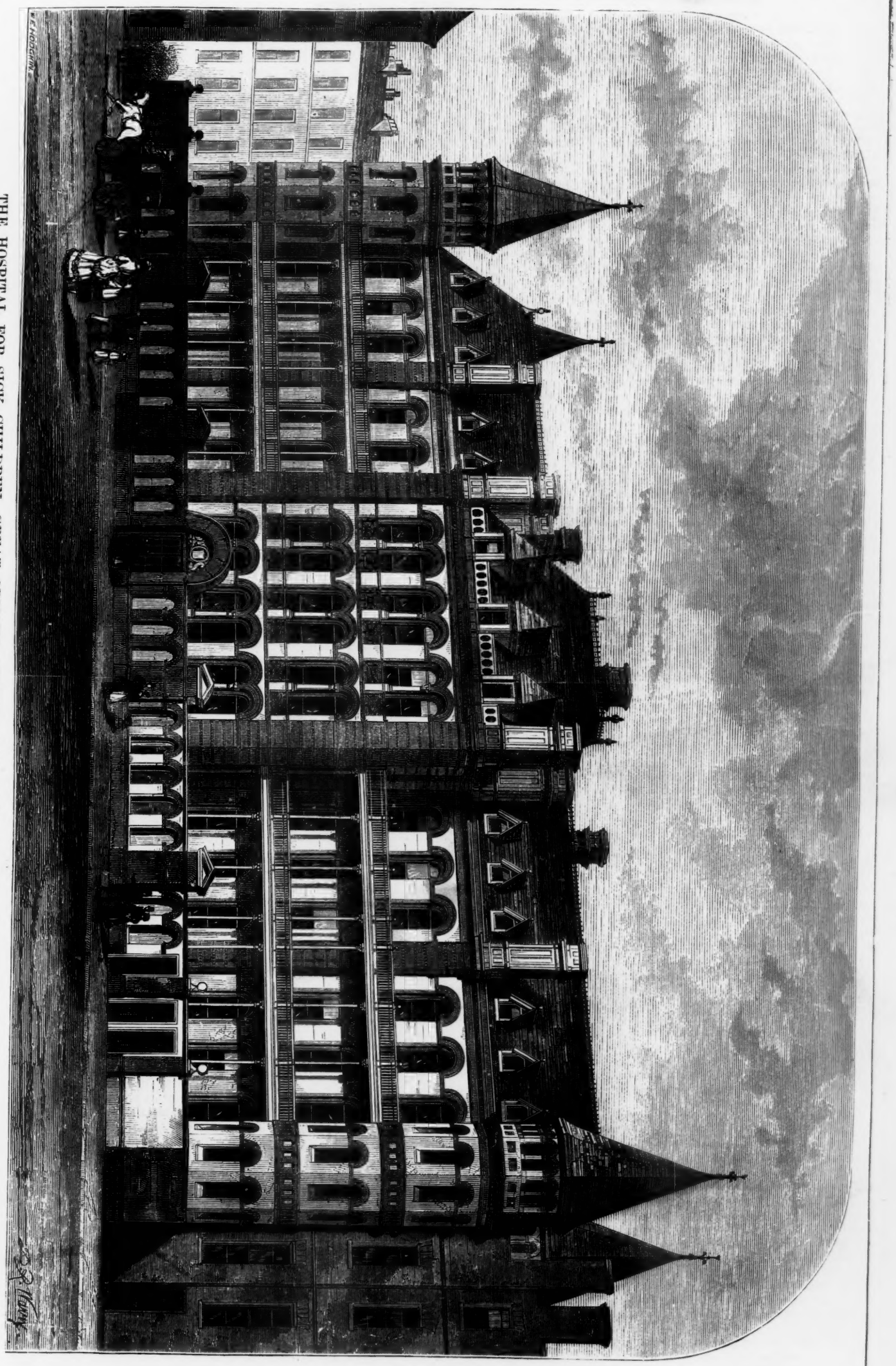
REFERENCE TO GROUND FLOOR.

A.A.	Hall and Stairs.	J.J.	Separate Wards.
B.	Chapel.	K.	Lady Superintendent.
C.C.	Wards.	L.	Ladies' Common Room.
D.D.	Ward Kitchens.	M.	Housekeeper's Office.
E.E.	Vestiaries.	N.	Secretary's Office.
F.F.	W.C.s.	O.	Nurses' Day-room.
G.G.	Bath-rooms.	P.	Committee-room.
H.	Porch.		
I.	Nurse's Room.		

BASEMENT FLOOR.

a.a.	Out Patients' Waiting Hall.	*j.*	New Patients' Waiting Room.
b.b.	Consulting-room.	*k.*	Post-mortem.
c.c.	Second Waiting-room.	*l.*	Study and Museum.
d.d.	Dispensaries.	*m.*	Dead House.
e.	Stores.	*n.n.*	Servants.
f.f.	Medical Officer.	*o.*	Dispensary.
g.g.	W.C.s.	*p.*	Medical Officer.
h.	Kitchen.	*q.*	Lobby.
i.	Scullery.		


CHILDREN'S HOSPITAL, ST ORMOND STREET
BASEMENT FLOOR
GROUND FLOOR
CONNECTION BRIDGE
ROOF OVER
OFFICES
GREAT ORMOND STREET
GREAT ORMOND STREET
SCALE OF FEET
0 5 10 50 100
N° 43
N° 45



THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET, BLOOMSBURY.—MR. EDWARD M. BARRY, R.A., ARCHITECT.

BUILDING ON THE PEABODY ESTATE AT BRIXTON.

BUILDING on a large scale is now going forward on the Peabody estate, at Shepherd's-lane, Brixton. This estate, comprising sixteen acres of land, which was purchased, some seven years ago, by the late Mr. Peabody himself, in connexion with his philanthropic intentions of erecting dwellings for the working classes, has for some time remained a waste, but recently the trustees, instead of building upon it themselves, have commenced letting it on ground-rents, and dwellings of a class somewhat above those known as for the poor are being erected in large numbers, according to plans and conditions laid down by the trustees. Several streets have been laid out, and we understand that the entire number of houses on the estate will shortly be about 500, being equal to a population of something like 3,000. It is stated that the trustees have decided to spend the large income which these ground-rents will produce in erecting, from time to time, blocks of houses in different parts of the metropolis, similar to those in Blackfriars-road.

MR. EDWARD WALTERS, ARCHITECT.

WE hear with regret that Mr. Edward Walters, of Manchester, died on the 22nd inst., at Brighton, after a few days' illness. He was architect of the Free Trade Hall, Manchester, and had a very extensive business, chiefly in the building of warehouses, many of which, as we have before had occasion to say, are of considerable merit. Mr. Walters had retired from the active pursuit of his profession for the last few years, but his business is still carried on by some of his former pupils. We shall give particulars of his career on another occasion.

NEW METROPOLITAN RAILWAYS, TRAMWAYS, AND MISCELLANEOUS IMPROVEMENTS.*

FROM year to year the number of permanent lines of railways, and in recent years of tramways, sanctioned, or actually opened, in the metropolitan district, increase in the aggregate mileage; but many of the proposed improvements shown in parti-colours, one year after another, disappear in succession, or the map of proposed improvements published annually by Mr Stanford would become so thickly lined as to be illegible. In recent years a notable change has occurred in some of the principal features of the publication. The lines of colour that ran athwart the map in various directions related almost exclusively to railways, with portions of colour in one place and another indicating miscellaneous improvements. This year the tramway lines opened, sanctioned, and proposed, are distinctively indicated in blue colour, and, in the aggregate preponderate greatly over the proposed railways. The most obtrusive indications in red colour in this year's map relate to street and other improvements, chiefly public thoroughfares and markets, and are proposed by the Metropolitan Board of Works.

The most important new railway proposed, as shown in the map, is the Mid-London, of nearly nine miles in length, traversing London between east and west. For this important scheme the large amount required by standing orders to be deposited, has been, we learn, duly lodged. The other new railways proposed, include a London & North-Western extension from West Ham to the Victoria Docks; alterations in the South-Eastern direct line between Greenwich and Woolwich, including a diversion of the southern outfall main sewer at Greenwich; also a connecting curve between the South-Eastern and the London, Chatham, and Dover lines at Blackfriars; a junction between the Waterloo Station of the South-Western and the Blackfriars Station of the Chatham and Dover; with a few other projects, some of which are not likely to be further heard of, more than one of them being already, indeed, defunct. The plans for new railways, as lodged Nov. 30, embrace twenty-nine branches, and about thirty-nine miles of new lines.

The metropolitan tramways that will come under the consideration of Parliament embrace 185 branches and 116 miles of line. Three of the projects are to be proceeded with by Bill. These are the Exhibition subway; London, Streatham, and Croydon; and the London Street Extensions; &c.; including the Oxford-street route, and eighteen miles of street tramway, in all. The London and Croydon Bill is for 9½ miles of line. One new provisional order tramway scheme is indicated for six branches and nearly two miles of new lines. Three Tramway Bills, which were suspended by order of the House of Commons, July 13th last, will be revived. They are for 57 branches and 22 miles of tramway. The consideration will also be resumed of eight other tramway projects that came under the Provisional Orders Suspension Act, 1871. They are for 86 branch tramways and 65 miles of line. The tramways of the longest mileage are, to Watford, by the Common Road Conveyance Company; to Croydon; to Southam, Ealing, and Shepherd's Bush: to Kensal Green, and to Fulham. The North Metropolitan Company has received Parliamentary sanction for the laying of many miles of tramway, as shown by the map, that are not yet constructed.

The miscellaneous improvements include, amongst others, the Admiralty and War Office rebuilding; Brighton and London sea-water supply; Holborn Valley and Farringdon Market improvement; Leicester-square Market and improvement; Newport Market and approaches; New Mint building site; metropolitan street improvements; Serle's-court and Cook-street improvements; and the Temple Subway.

The map is one of the most interesting that has appeared.

* New Maps [of Plans, &c.] deposited in the Private Bill Office, November 30th, 1871, for Session 1872. London: Edward Stanford, Charing-cross.

ABOUT A NEW STYLE.

SIR,—The cry for a "new style" is so loud and continuous that it cannot be passed by without notice, and hence we find that almost as often as the cry is raised has the attempt been made to satisfy it. How far successful, the greater part of your readers know. Now, although I am going to lay a plan down for this nineteenth-century English want,—we do not find it abroad,—I must say that the cry and the response are equally the offspring of ignorance of all history, as well as ignorance of and feeling for art. As well may the Bosjesmen be able to spring at once into a high state of cultivation without the necessity of passing through those intermediate stages, as much required by a reasonable being before being convinced, as by the necessity for the convincing example of others more civilised than himself, as that a new style can at once be invented possessing all those æsthetical qualities required by the true canons of art, without the blast of ages and the refining influences of many workers.

In this age of iron and glass it has been suggested that those materials should form the foundation of an original architecture. To some extent they will, but iron for art is a terribly hard substance, and glass is a brittle one. The former for the purposes of art is little superior to the latter. Architecture, to be worthy of the name, should be unornamental, should last for ages, should upon every portion bear the mind of the different artists employed, should be fashioned by the hand of the cunning workman in stone, embellished by the sculptor, and glorified by the colourist. Iron and glass will never fulfil the conditions required by art, nor can wood, since it is too easily destroyed for any great art-work to be devoted to it. This more especially as regards edifices. Wood-carving, we know, was raised to a high pitch by our old Mediæval workers, and in modern times by Grinling Gibbons; but much of the former has been devoured by time and destroyed by man, whilst the edifices which once contained much are now empty.

Stone presents more favourable conditions than anything else in building materials for the architect. Terra-cotta, and all burnt earths, whether called bricks or any other name, since their production entails mechanical processes, and these mechanical processes imply or determine repetition of parts or wholes, should never be used for monumental purposes, except for solid unadorned surfaces. A reason can easily be given. The designer produces a portion of the building in clay or stone; it is reproduced in terra-cotta; it may be ten, it may be a hundred,—ay, ten thousand times; and every time that such art work is produced more than once it loses value, as surely as a painting, if it could be reproduced as many times, would. It might be said, "Yes, it is none the less a work of art. You cannot make a thing less beautiful by repetition." I say you can. If every beautiful woman were similar, and all women were beautiful, then would the eye see no beauty, but long for a change. The mind and the eye must be equally impressed, must teach art in concert, either for pleasure or pain. Thus, I argue, our new style of architecture must be a creation in stone, and that no new style can be revealed upon the spurt of the moment, but must be the work of ages; and yet I come and say, "Here is a new style; behold the clamouring hath its want, the agitator his will." Certainly "with reservations." Before producing this wonderful child, maybe I may ask the number of styles now extant. Shall we start with Syrian, or Egyptian? Shall we follow them with Grecian? and shall we divide Grecian into three, and then deny that the Romans had any architecture at all? If we do, our premises are narrowed considerably, and the more we try to work upon them the more they contract, until we find ourselves back in some remote age when the upright post and horizontal lintel are magnified to such an extent as to dwarf all after productions; but, not to be beaten, we start again. We argue there are only three roots, if I may so say, which have produced all ramifications, the greater of the ramifications being called styles. The three roots are the post and lintel, or horizontal root; the semicircular arch root; and the pointed arch root, each root nevertheless primarily shooting from the same plant.

Now, these roots and ramifications being admitted as necessary, if we admit that Greek art owed its origin to some previous growth, then the previous growth of Roman being Greek, Roman art has as much right to be classed as a style as Greek art, especially as the arch became an important feature. All styles are not, of course, equally distinct or well marked; in fact, the growth from the Roman for centuries was both laboured and slow. Scarcely do those phases popularly called Romanesque or Byzantine deserve the name of style. They really bear the same relation to Roman or Greek art which our Tudor or later Gothic, rightly termed debased, bears to the First, Second, or Third Pointed, with this difference,—the Romanesque led to one of the healthiest roots, or branches, if you will—the Pointed style,—our Norman being a description of Romanesque. The Tudor ends with rottenness and death. It has led to no art, and at the present time it seems that it never will. Taking real architectural art as commencing with the Grecian, tracing it through Roman, Byzantine, Norman, and the Pointed, we find many off-shoots almost as strong as the main trunk. Arabesque deserves a place to itself, as being a mixture of Romanesque and Hindoo; but, for the sake of my present argument, I had better not touch upon Hindoo art as China, with her early origin, would certainly claim precedence and continuing influence, as it is not unlikely that, although she kept so exclusively to herself, some wanderers had seen her architecture, and bore the knowledge of it westward.

We can now pretty well ascertain the number of admitted styles. We can see that one style was the off-shoot or continuance of a former, or many former styles. That, in fact, Roman art proper was a simple continuance of Greek. I do not mean Roman temples, for they were simply transplants, but their civil buildings: and here I will instance the Coliseum, and deduce from its treatment the production of a style—the Italian style. The manner in which this style was moulded and fashioned is both curious and instructive. An age of magnificence had arisen in the history of Rome, when the people had to be considered as well as the warriors and priests. Places of amusement had to be provided for vast numbers, and architecture seemed wanting, for several reasons. Had Doric, Ionic, or Corinthian buildings been erected as heretofore, no known material could have been obtained sufficiently large to span intercolumniations in such numbers as were required. Truly, blocks of granite might have been found, but the time and expense in the quarrying, in the carriage, and in the erection of such monoliths, would have entailed a never-ending task. A building had, therefore, to be provided containing the increased space without necessarily increasing the size of the materials employed. Knowing as we now do the course pursued, we can hardly appreciate the difficulties to be overcome, or the success and applause which followed the achievement. The employment of one order in height having been found impracticable, the dodge or alternative was to use two orders. Common sense as well as mathematical and practical

knowledge, without much reference to art, would at once dictate the position of the orders; the strong to support the weak, the heavy below the light, the elegant and slender above the severe and robust.

My argument, therefore, is this: the Romans, who were certainly a wise people in their generation, did not rave about, did not attempt to produce, an entirely new style, however much they, as conquerors of the known world, might have deemed it incumbent to produce one; but sensibly took up a style which they found, and modified it in the manner before hinted at, taking the Greek orders almost as they found them, and clapping one upon another.

This, with the introduction of the round arch, led eventually to our own Mediæval orders—Norman, Early English, and Geometrical,—which mutually I will term chords of Doric, Ionic, and Corinthian, in the Greek. Perpendicular may be sympathetic with the Roman composite,—I mean no parallel. Why, therefore, should we not copy the Romans in this instance, as we seem to be doing in others? and, having already to our hand Norman, Early English, and Edwardian, treat them as the great colonisers treated the Greek,—using the first, second, and third as ingredients in the same building? The Norman heavy, stable, and bold for the main support; the Early English as lighter, less heavy, and more pliable above it; and Edwardian as richer, more elegant, and more varied above that. The best phases of Perpendicular (I cannot say Henryddian,* being no Welshman), in case of a very lofty building, might be pressed into the service. With the three or four phases of Gothic used in the same building,—the eternal sameness which so palls upon the taste in all our modern Gothic secular buildings, would be got rid of. The terrible nightmarish striving-after-novelty-change-any-thing-for-variety-sake would be less needed; and these old breeds being all grafted together upon one stem, would not unlikely bear a description of architectural plum before unknown, which would satisfy the craving for a new style, now amounting to a disease, which possesses seven-eighths of the community.

I am not joking, sir. I know that much of the beauty of our old Ecclesiastical edifices results from the juxtaposition of the different phases of Gothic art. There is one noble building which disappoints me the more I examine it, and I think the absence of this interweaving of styles is the cause. I mean Salisbury Cathedral. Admitting its splendid proportions, the harmony and beauty of its grouping, as seen from the east on a moonlight night, upon examination there is a stringiness, a poverty, a weakness, solely attributable to the constant—and too constant—repetition. Examine the window above window in the transepts, one flight above another, which from the outside impress you as lighting different chambers, but from the inside utterly confuse you, and tell me if there is not some reason for my assertion.

In modern buildings of large dimensions, I may mention the Houses of Parliament, which have caused their designer and all connected with them infinite labour and pain from the use in their design of only one phase of Gothic,—twist it, repeat it, pile it up as you may. Enrich it—till, if worked, it should turn out one of the best gold-mines ever discovered—from the amount of ore thrown into it. Still is there a certain poverty, undiscoverable in one of our plainest old Gothic buildings with the exception of some few which have had the misfortune to be erected in one style. And so surely as the new Law Courts are put up will they also be a failure from the same cause.

The reason is this. We, as well as the Romans, indulge in monster buildings. Now these gigantic affairs are beyond the range either of Doric or Decorated; for consider, had the Romans, instead of using five orders in the Coliseum, used only one, what description of affair would it have turned out. Should they have employed but one order for the entire height, then behold the size of each column; should they have used Doric above Doric, then look ye at the maddening repetition. The Greek buildings were small and compact; one order thought out was sufficient, and then in some of their largest buildings I have no doubt the architects and builders had as much to do as they well knew how.

Why, then, should we not do as the Romans did,—cast from us the desire to achieve the impossible, by endeavouring to make either Roman, Early English, or Decorated do singly what a Greek order could not and cannot do; and take into our hands all our Gothic styles, and mould them into a whole as harmonious as any Italian building under the sun. I for one will, the first opportunity I have, try the effect of such a building, and I dare swear it will not be one of the most unsightly.

MARTIN UNDERWOOD.

* Pron. *Henrithian.*

WORCESTER GUILDHALL COMPETITION.

AT a special meeting of the Worcester Town Council, a Report from the Survey, Buildings, and Property Committee, on the state of the Guildhall, was read. It contained, among others, the following resolutions:—

"That it be recommended to the Council to authorise this committee to obtain plans for the reconstruction of the Guildhall, giving the requisite additional accommodation, and that architects preparing plans be requested to limit the expenditure to 9,000*l.*"

"That, in the opinion of this Committee, the wings of the Guildhall are in such a bad state of repair that they must at some early date be entirely rebuilt; and that the committee, having regard to this, be authorised to obtain (in addition to the plans recommended by the foregoing resolution) plans for the entire rebuilding of the Guildhall and wings and offices, at a total expenditure not exceeding 18,000*l.*, in order that the Council and the citizens generally may be in a position to judge whether it would be better to reconstruct or entirely rebuild, and that it may be ascertained whether any large portion of the amount can be provided by voluntary contributions."

The report was received and adopted; and the Council also resolved that the competition be thrown open, instead of being limited to architects of the city and county of Worcester, or the city architect (Mr. Rowe), as proposed by amendments.

It was agreed that premiums of 60*l.* for the best and 30*l.* for the second best plan for the reconstruction be offered; and premiums of 100*l.* and 50*l.* for the best and second best, respectively, for rebuilding.

The committee were directed to prepare instructions for the architects, and lay the same before the Council.

THE DECISION IN THE WORCESTER SCHOOL BOARD SCHOOLS COMPETITION.

SIR,—With this I send a copy of a protest which has been lodged by me against the recent decision of the Worcester School Board, by which they placed Mr. E. A. Day, of Worcester, with motto "De Die," first; and myself, with motto, the arms, and "No Extras," second, in competition for their schools.

As the reception of drawings after advertised date is an unheard-of proceeding, which, if allowed to pass unchallenged, will operate most seriously against every member of the profession, I politely request every architect, whether a competitor or not, to at once write me to London address (135, Cheapside,) an endorsement of my protest, as I consider in acting as I am doing I do so as much in the interest of the profession generally as for my own benefit.

The next ordinary meeting of the Board takes place on Thursday, the 1st of February, and letters posted on Wednesday will reach me at *Worcester*.

As I consider the matter one of vital interest to us all, I trust you will find room for a copy of the protest. W. SECKHAM WITHERINGTON.

"January 19, 1872.

To G. W. Hastings, esq. chairman,
Worcester School Board.

PROTEST.

Sir,—Having received intimation that your Board have placed Mr. E. A. Day first in the school competition, and have awarded the premium of 30*l.* to myself, I beg respectfully to enter the following protest against Mr. Day's plans being carried out:—

1. The motto 'De Die' is a palpable play upon his own name.

2. That two or three days previously to the 30th, being extremely pressed for time, I sent to Mr. Marcus (the secretary), to say that, as the 31st (the day named in the advertisement for sending in the drawings) fell upon the Sunday, I should be glad to know when plans were to be delivered. The answer returned was, 'Plans must be delivered before the 31st.'

3. On Saturday, the 30th, I sent to the Guildhall, to know what was the *latest hour* for the delivery of the plans, and the answer was, 'Five o'clock to-day;' and although any extension of time would have been invaluable to me, my plans were deposited before that hour.

4. Though this information was given officially, of my own private knowledge I know that Mr. Day's plans were not delivered on Saturday; whilst I have positive proof that his drawings did not leave his office till after eight o'clock on Monday night, the 1st inst., at which hour, it would be only reasonable to suppose, the Guildhall offices were closed.

5. I need only say that the great principle of all competitions is a certain time of delivery for all, and I am confident that it will be only necessary to explain to you and to your committee these facts, of which you have, of course, been hitherto ignorant, to insure that justice shall be done to me, and Mr. Day's plans disqualified."

Mr. Henry Haddon, of Messrs. Haddon, Bros., Malvern and Hereford, whose design, "Idoneum," was third, endorses the foregoing protest.

*** If the circumstances be as stated, the impropriety of the proceedings is manifest. Such a course admits the possibility of a favoured competitor being enabled to see the designs of other competitors before completing his own. Beyond this, however, it can scarcely be doubted that the decision is illegal; it is a breach of contract. If the matter be properly brought to the notice of Mr. Hastings, we have no doubt it will be set right.

TECHNICAL EDUCATION.

THERE has been a general meeting at Sir Antonio Brady's chambers, of the gentlemen who have taken a prominent part in the movement having for its object the establishment of a national technical university, for the purpose of completing the arrangements to establish an association representing all the interests involved.

It was stated that Colonel Gourley, M.P., had offered 500*l.* towards the establishment of the university. The result of the debate was the passing of resolutions deciding that the name of the amalgamated organisation should be the National Technical University and Trades' Education Association; that Sir Antonio Brady be the chairman of the council, and Colonel Gourley, M.P., chairman of the executive; that Mr. Scott Russell and Mr. R. M. Latham act as vice-chairmen of the council; that Mr. Thomas Brassey continue to act as treasurer; and that the hon. secretaries should be Dr. Mill, representing the original Technical Education University Committee; Mr. Campin, representing the Inventors' Institute; and Mr. Paterson, representing the working men.

It was understood that these appointments were provisional. An executive committee was also elected.

CITY SEWERS STILL DRAINING INTO THE THAMES.

AT a recent meeting of the City Sewers Commission a report was received from Mr. Haywood, showing that no less than nine main sewers and nineteen smaller ones still drain into the Thames within the limits of the City; although in the last report of Mr. Bazalgette it was stated that there only remained certain portions of the lower outfall to be finished, and that the whole of the works were complete with the exception of a short piece at Blackfriars Bridge connected with the Fleet outlet.

Mr. Hora said that such a report as that just presented might well astonish the people of London, after spending 444,000*l.*, and it should be borne in mind that there were something like twenty or thirty inundations every year.

The Chairman observed that this was one of the most important subjects that court had had before it for some time. As an evidence of this he read an extract from a report of a deputation from King's-cross and neighbourhood which waited upon the Metropolitan Board of Works on the 20th of last December. The extract had relation to the periodical inundation of the lower and basement premises.

MEETING OF BUILDERS.

A MEETING of master builders of the metropolis has been held during the past week, to consider the requisition of the Operative Stone Masons' Society to work uniformly all the year round 51 hours per week, and for a rise of wages from 8d. per hour to 9d. per hour from the 1st of July next. The proceedings have not been made public; but we understand that a unanimous opinion was expressed that 51 hours per week could not be agreed to, the engineers and other trades having just settled on 54 hours per week.

It was also generally agreed that it was an absurdity on the part of the masons to ask to work the same hours in summer as in winter, when dark days, frost, and bad weather interfere so very much with all building operations; and several masters expressed their opinion that no mason in their employ was able, under the present rule, to make an average of 54 hours per week all the year round.

It was also generally agreed that it would be almost an impossibility for masons to come and go at different hours to the bricklayers and other men on a building, and that to reduce all other trades down to 51 hours per week, in order to meet the demands of the masons, would be an act of injustice. The meeting was also of opinion that the present rate of 8d. per hour for an ordinary mechanic was a good rate of wages, and that the state of trade in London did not appear to warrant any increase. Ultimately it was determined to adjourn the meeting in order that some other builders not then present might be consulted before a decision was arrived at.

STAIRCASE AT THE LONDON TAVERN.

SIR,—Having just returned from the London Tavern, after two days' polling in behalf of candidates for admission into the London Orphan Asylum, I cannot but draw your attention to the state of the pieced stone staircase there. You did good service some years ago in drawing attention to mended stone staircases and cracked landings after the fatal calamity at the Polytechnic Institution. I am not an unnecessary alarmist, but most people who have visited the London Tavern on occasions such as I allude to know well how many persons spend the day on this staircase. The distress amongst widows and children, draped in black, on this staircase is always evident on these occasions, and there should be no possibility of a harrowing accident. I need not state that there is such a possibility, but I must say that any professional man visiting this staircase cannot but be struck with its apparent insecurity as the treads have been cased. Prevention is better than cure.

F.R.I.B.A.

DRAIN PIPES.

WILL you allow me to express an opinion upon the paragraph,—"Iron Pipes for House Drainage," page 43, of your last week's impression?—

No cleaner, cheaper, more durable, or better adapted article can be used for house drainage than socketed, glazed stoneware pipes, jointed in cement. If the joints are left imperfect, gross carelessness is denoted on the part of those superintending, which need not occur where due vigilance is exercised. Iron pipes are more costly, to begin with; they oxydize, become filthy, and from the chemical action of the sewage soon wear out. Iron pipes should only be used where a sewer is cut through a quicksand, or in similar exceptional cases where the cement joints of stoneware pipes cannot be made.

R. Y.

BETHNAL-GREEN.

SIR,—The remarks in your paper of last week concerning Bethnal-green are so much in accordance with a recent letter of mine, that I send you a copy for your use.

I may add that while the population of Bethnal-green is about 1-27th of the population of the metropolis, the pauperism is about 1-36th, but the rateable value is only about 1-64th. In consequence of this state of things, Bethnal-green receives from the Metropolitan Common Fund nearly 11,000*l.* yearly, or about 30*l.* per day, while the two (so-called) improvements in High-street, Shoreditch; and Bethnal-green will saddle the metropolis with a tax of more than 40*l. per day* for the next sixty years. I know of only two ways of bettering either a man's or a parish's condition. Either increase his income or lessen his expenditure. In Bethnal-green the latter is next kin to starvation. The former plan has yet to be tried.

T. G. ATKINS.

HEREFORD PASTORAL STAFF.

THE clergy and laity of the diocese of Hereford intend presenting their bishop with a pastoral staff, and have selected a design submitted by Messrs. Cox & Sons, of Southampton-street.

It will be carved out of a piece of oak which recently formed part of one of the ancient pillars of the bishop's residence at Hereford,—a twelfth-century building,—and will be surmounted by a crook of the usual form, enclosing a carved figure of our Lord, seated as a king, holding an orb and cross in the left hand, the right hand erect in the act of blessing.

The crook will be mounted in silver, with crockets also in silver, jewelled and embossed; and from the lower part of the crook there is a floriated bracket supporting an angel with displayed wings, carrying a silver shield bearing the name of the diocese, in enamel. The bands, crockets, and bases will be enriched with carbuncles in ornamental settings, and cut in the ancient form, the general style of the work being that of the thirteenth century. The fashion of presenting a staff to bishops has spread: this is the ninth, we believe, given within the last few years.

RAIN-WATER TANKS.

"STAGNUM," in a recent issue, asks for more information as to coating brickwork of tanks. If good Portland cement be used with one-sixth sand a sufficient thickness is one quarter of an inch, but it should stand about fourteen days to harden properly before water is admitted. Each side should be laid on without a joining, and the angles rounded out. The bricks on which the cement is laid should be damp, and the surface clean. The cement should be well rubbed, too, and not allowed to slide while soft. Neat cement, three-quarters of an inch thick, will be more apt to crack and blow out than a thin coat. The walls of the tanks should be built with equal parts of cement and sharp sand. If in a dry situation, and lime is used for building, the lime in the joints should be well raked out, and the walls should be firm enough to resist the pressure of the water.

W. B. WILKINSON.

DAMP WALLS.

SIR,—Having erected several buildings in exposed situations in Lancashire and Yorkshire where the driving rains will often penetrate the hardest stone, I am willing to give your correspondent "Devonia" the benefit of my experience.

Walls built with rubble or coursed wall-stones consist of an inner and outer casing, which is usually filled up in the middle with small pieces or scraps of stones, and then grouted with mortar so as to make a solid mass, bond-stones being introduced to hold the two casings together. In very wet situations the rain penetrates the outer casing, either through the mortar joints or the stones themselves, and is then drawn by capillary attraction to the inside casing. To prevent this the centre should be filled in with *dry* scraps and not grouted; the water then penetrates the outer casing and runs down the middle of the wall to the foundations, so that the inner casing is left dry. The bond-stones must also be weathered or tilted outwards, so as to throw off any wet that may enter at their top bed. Window-heads should also have a thin sheet of lead or zinc laid on the top bed and turned up inside the wall, so as to prevent wet from driving in over them.

If the building is in the neighbourhood of gas-works, a grouting of hot gas-tar boiled up with some pitch, and poured into the middle of the wall as it goes up, will make it thoroughly water-tight, and impart a great amount of strength and solidity; this process adds considerably to the cost of the walling, but I have found it thoroughly efficient where other methods have failed.

A coating of Portland cement gauged with two parts of sharp sand *ought* to keep the weather out in any situation, and I expect the failure has arisen from using too much sand, or some other fault in the mixing or materials.

In building with brick in an exposed situation a similar plan should be adopted; an outer casing 9 in. thick, and an inner one 4½ in. thick, are carried up together but quite distinct, leaving 2 in. between, and tying them together by means of wrought-iron bands 9 in. long bent downwards in the middle, and spread out flat at each end so as to have a hold on the wall. This method is much used in the neighbourhood of Southampton.

Inside walls and partitions, if built of stone, will often show damp for a long time after they are built, as all stone contains in its natural state a considerable quantity of water, which is evaporated by the internal warmth of the building, and will appear like a sweat over the surface, through any number of coats of paint. It is therefore advisable to use brick for internal linings and partitions in preference to stone.

E. WYNDHAM TARN, Architect.

CARBONIFEROUS limestone, some beds of the lias, slate rubble, and a few other stones, where used for walling, have a tendency to condense the atmospheric vapour, causing it to trickle down the face of the work, and prevent the use of paper.

A wall, properly coated outside with Portland cement, cannot admit rain. The defect is doubtless in the nature of the rubble backing, and the only remedy is to batten the inner face of the wall, using iron holdfasts to fix the battens, and packing them off the wall about ½ in., the wall to be pierced by a few interstices left in the joints under the eaves course and under the floor-line, to allow a current of outer air to circulate behind the battening, to preserve the wood and, as far as possible, to dry the moisture from the face of the rubble. The joints of the floor-boards should be grooved and tongued, and the wood skirtings tongued into the floor-boards, to prevent undue draughts of air in the rooms.

A SUB.

SIR,—To either paint or cement the exterior of any building generally interferes with the design. I consider the best plan is to deal with the inside walls in the following manner:—Take off the old plaster from the walls that are damp, and put on a rendering coat of the best Portland cement, without sand, about ¼ in. thick; then put on a coat of equal parts of Parian cement and sand, to bring the wall to a level surface; and afterwards a finishing coat of Parian cement alone, of about the thickness of one-eighth of an inch; and when this last coat is setting, which you will notice by its changing colour, give it a coat of paint mixed up with very little oil in it, the object of which is to keep the chemicals used in the manufacturing of it from rising to the surface, often throwing off the paper if this is not done. This plan I have tried many times, and have never found it to fail. Of course, a great deal depends upon the cement being used properly, and it being of the best quality.

JOHN RUSCOE.

AN ODD OBJECTION.

LAMBETH WORKHOUSE.

AT the last meeting of the Lambeth Board of Guardians, Mr. R. Taylor complained that although Mr. Parris was the architect of the new workhouse, yet his partner interfered in various matters. He thought if this course was pursued, they might involve themselves in some difficulties.

Mr. Higgs said no order for work could be given by the architect for a sum exceeding 25*l.* without the sanction of the Board.

After a discussion, it was agreed that the clerk should write to the architect, and request him to attend the Board personally upon all matters connected with the new workhouse.

SCHOOL-BOARDS.

London.—AT the last meeting, on the 24th inst., Mr. Reed, M.P., moved the adoption of a Report from the Works Committee, calling to mind that the Board, on the 9th of August, requested the Works Committee to consider and report upon the question of obtaining architects and securing designs. The Board further resolved, on the 10th of January, 1872, that the system of class division should be tried on the Essex site, in Stepney. The Works Committee now recommended that, for the erection of this school, there should be a competition of architects, not exceeding twelve in number; that it should be referred back to the Works Committee to advertise for candidates, to select a number not exceeding twelve, and to submit the plans prepared by the competing architects to the Board. This recommendation gave rise to a long discussion, the result of which was that the whole matter was referred back to the committee, principally for the purpose of their finding out a larger site. On the motion of Mr. Reed, M.P., the Works Committee were empowered to recommend the engagement of four agents for two months, at a salary not exceeding 2*l.* per week, to assist the architect in looking out for sites, and premises to be hired, in those blocks in which the Board has decided, or shall hereafter decide, on the recommendation of the Statistical Committee, to erect schools.

Leicester.—At a meeting of the Board for discussion with Mr. J. R. Blakiston, Her Majesty's Inspector of Schools, Alderman Burgess said he wished to ask a question with reference to the sort of schools for which they would require architects. It seemed to him that they could not stir a step with the architects till they had

settled what kind of schools they were to build, as they must give them instructions. Their British Schools were built exactly in accordance with the plan recommended by the British and Foreign School Society. They had not been built above ten years before they found they had made a great mistake; they had altered and altered four times since the schools were built, and it had involved them in great expense. Of course they all felt that it was exceedingly desirable that they should start well, on the best possible system; and perhaps the inspector would give them his idea how they could get the best possible system of laying out their schools, and have them built so as to accommodate the children in the best possible way. The British schools at present wanted another remodelling, as the inspector would agree, but how to do it he did not know. He thought they would have most carefully to consider the plans of their schools, and he should like to ask whether the Department had arrived at any conclusion on this point, or issued any direction or suggestion to the School Boards on this subject. Mr. Blakiston said he thought not. If they adopted the present system of pupil teachers they had hundreds of models to go by; and if they adopted the Prussian system they must inquire abroad. The Rev. R. Harley said he understood the inspector to mean that if they adopted the Prussian system they would have to be guided very much less by the experience of the past than otherwise; but if they adopted the old system he was in favour of large schools,—at least, large schools were more economical, and that if they put in thoroughly efficient men they were the most efficient schools, but the difficulty was to get the men to manage them. Mr. Blakiston said, the largest school he had in his department was a school of 300 boys, but not many masters could manage it.

Derby.—At a meeting of the local School Board a report of the School Plans Committee was read. It stated that,—

"On Monday, the 8th of January, your committee met to receive the plans sent in. The clerk reported that he had received eleven sets of plans under seven different marks or mottoes, viz., three plans marked 'Alpha,' two marked 'Education,' one marked 'Lætus Honore,' one marked with a 'Red Spot,' two marked 'Nota Bene,' one marked 'Prodesse quam conspici,' and one marked 'Non Semper. . . . . At the adjourned meeting on Wednesday, the clerk reported that he had received on Monday evening three other sets of plans marked 'In Spe': as these were sent in after the time appointed they were not admitted for competition. In making the selection which they submit to the Board for adoption, your committee have been guided by the consideration of light, ventilation, and internal fitness for school work, rather than by the external appearance of building. The question of cost also has been duly considered by the committee in their selection. After very mature deliberation your committee resolved to recommend the plan marked with a 'Red Spot' as the first; 'Nota Bene' as the second; and 'Lætus Honore' as the third. On opening the sealed envelopes, it was found that the selected plan had been prepared by Mr. T. Coulthurst, architect and surveyor, No. 10, Wilmot-street; the second by Messrs. Giles & Brookhouse, architects, St. James's-street; the third by Mr. G. Sheffield, architect, Bank-chambers, Derby."

The confirmation of the committee's report was unanimously agreed to. Mr. Beswick then moved, as a substantive motion, that Mr. Coulthurst be appointed the architect for the superintendence of the erection of the new schools in Gerard-street, and that the premium of 10*l.* offered for the second best plan be awarded to Messrs. Giles & Brookhouse. The proposition was carried unanimously. A building committee was also appointed to carry out all needful measures in connexion with the erection of the new schools in Gerard-street, the committee to consist of the chairman, the vice-chairman, Mr. Thompson, Mr. Shaw, Mr. Holmes, and Mr. Roe. The clerk was empowered to apply to the Education Department for a loan of money needful to erect the new schools in Gerard-street, so soon as it should be ascertained what was the sum required for that purpose.

CARRIAGE ACCESS TO THE THAMES EMBANKMENT.

IN the Vice-Chancellor's Courts (before Vice-Chancellor Sir John Wickens), The Marquis of Salisbury *v.* The Metropolitan Board of Works, is a suit instituted in reference to certain land reclaimed on the Thames Embankment, opposite the end of Salisbury-street and Cecil-street, and which has been laid out as a garden. The garden is surrounded by railings, the gates being locked at night, and the question turns on the construction of the Act of Parliament authorising the construction of the Embankment, under which rights of access are reserved to the Marquis and his tenants. The case was being heard on an interlocutory application for a motion for an interim injunction. It appears that the Marquis has in contemplation the erection of a large and important class of buildings upon this low level ground, and it is in respect to the erection of these that he seeks immediate relief, by injunction, for the purpose of enforcing his right of road from the Embankment-road across the ornamental gardens. The question mainly depends upon the interpretation to be put upon Section 62 of the Thames Embankment Act, 1862, which has special reference to this property.

The Vice-Chancellor, in delivering judgment, said, the question was whether the property to which the reservation contained in the 62nd section referred is limited to Cecil-street and Salisbury-street, or whether it includes the low-level ground also. Without desiring to express any final opinion on the point, his Honour intimated his view that the reservation was solely for the benefit of the owners and occupiers of Cecil-street and Salisbury-street. The word "tenants" must be held to mean future tenants of houses in those streets. If it had been intended to comprise future tenants of the low-level also, he could not see why the low-level should not have been specifically mentioned. The right of the plaintiff to a carriageway from the Embankment to the low-level ground was too doubtful to be enforced on motion for a mandatory injunction; but, as at present advised, his Honour thought that the inhabitants of Cecil and Salisbury streets had a right, at least, to a footway at all times across the ornamental gardens to the Embankment-road. Holding this view, he directed the motion to stand over until the hearing of the cause.

INDEX TO THE "BUILDER."

SIR,—I cordially second the proposition of your correspondent, that you should publish a useful Index and Reference to the *Builder* (at the end of the year) from the commencement—the same to form a volume of itself,—and will most willingly contribute towards its production, having been a subscriber from your No. 1 to the present time, and having all the volumes bound up.

Frequently finding great difficulty in obtaining information required without loss of time in long searches, is my reason for troubling you with this. F. E.

THE "STANDARD" OFFICE NEW BUILDINGS.

AMONGST the improvements at present in progress in Shoe-lane, the extensive buildings which have for some time been in progress for the *Standard* newspaper, and which are now approaching completion, attract notice. The premises, which have been erected from designs furnished by Mr. Parkinson, architect, form a prominent feature amongst the surrounding buildings, and altogether occupy an area of about 700 square yards, extending in the rear to a depth of 100 ft. The main elevation in Shoe-lane is 60 ft. high to the parapet, and contains a frontage of 61 ft. in length. The materials used in the ground-floor and first floor of the elevation are stone, the upper stories consisting of brick, with bold stone facings. The several entrances and windows on the ground-floor, as also the first floor, are semicircular-headed, ornamented with carving, whilst the windows of the second, third, and fourth stories, in number eight each, are segment-headed. The principal entrance is wide and massive, surmounted in the centre by a carved head, whilst between the windows of the first floor are two similar carved figures, somewhat smaller in size, with the words "*The Standard*" in large characters, cut out of the stonework. The interior arrangements and fittings of the structure are, or appear to be, very complete. Apartments in the third story are specially devoted to a large library and reading-room for the use of the employés on the establishment. Immediately adjoining are the new premises erected for Messrs. Dellagana, for stereo- and electro-type purposes, and which are also approaching completion, under the same architect; Mr. John Anley, of Brunswick-place, City-road, being the contractor for both.

CHURCH-BUILDING NEWS.

Godstone.—The parish church has been enlarged and re-opened. The work was done by Mr. Carruthers, of Reigate, after the designs of Mr. Gilbert Scott, architect, who has retained all the relics of antiquity found during the work. The cost of the restoration amounted to about 4,000*l.*, of which sum 1,000*l.* were given anonymously by "A Friend." Mr. Macleary, of Pendell, also contributed 800*l.* On the opening day the sum required only amounted to about 300*l.* The works carried out included the removal of a south transept, the galleries and pews also being swept away, the building of a south aisle, restoration of tower, including the raising of the steeple 16 ft., the opening of the roof of nave, the insertion of a west window, and west and south doorways according to remains found. The west doorway (as also the south) is Norman. This is formed of stone given by Mr. F. M. H. Turner, of Leigh-place, who also gave the stone used for the external work. Stone from the quarries here (of which Henry VII.'s chapel at Westminster is built) is used for the arches, columns, &c., the walls being lined with stone from Kent. The seats are open, and of oak. The pulpit remains the same, but the stone base has been carved. A porch of oak has been built on the south side, near to which door the font is placed. It was intended at first to have a winding staircase to the ringing-floor at the south-west corner of the tower; but on the removal of the old vestry, &c., traces were found of the original staircase at the south-east corner. This had been at some time completely cut in two from top to bottom; it has been restored. The tower, which is now open to the church, has a low carved stone screen separating it from the chancel: in it is placed an effigy, executed in white marble, of the late Mrs. Macleary. A groined oak roof has been placed in it, and the quaint windows are filled with stained glass. The paving is, we believe, to be of coloured marbles. This is at the cost of Mr. Macleary. A new treble bell has been given by Mr. Thomas Rose. A three-light window on the south side has been filled with stained glass, representing the "Good Shepherd," by the family of the late Mr. W. Stenning, of Godstone Court. The east window was already of stained glass, put in by subscription to the memory of the late Archdeacon Hoare. The window on the south of the chancel has been put in by Mrs. Hoare as a memorial to the same: it contains figures of King David and St. Cecilia. The reredos, of stone, has seven arches, the columns being of red marble: it is carved. The east wall on either side is lined with encaustic tiles, and above is the legend on a gold ground, "Holy, Holy, Holy, is the Lord of Hosts; the whole earth is filled with His glory." Above this is a cornice of quarry stone, carved by the rector. The pulpit was carved by him when the chancel was restored a short time since.

Pateley Bridge.—The Church of St. Cuthbert was re-opened on Thursday, December 21st, by the Rev. Bishop Ryan, of Bradford, after having being closed for some time during alterations. The gallery has been removed, and the old pews have been replaced by stalls. A stone pulpit and reading-desk have been erected. The alterations have been carried out by Mr. Grange, of Pateley, from the designs by Messrs. T. H. & F. Healey, architects, Bradford. This is one of the Parliamentary churches of the early part of the present century. A system of decoration has been employed in order to deal with the unbroken monotony of the interior. The wall of the nave has been arranged in three divisions of colour. The dado is brown; forward to the springing of the window arches, it is citrine, relieved between each window by a centre ornament containing Christian emblems; above that it is of a deep buff powdered, with conventional roses and *fleurs-de-lis* in brown. These divisions are marked by borders on vellum grounds. The chancel, reredos, and tablets are illuminated in both stencilled and painted ornament. The whole of the decoration was done by Messrs. S. Bottomley & Sons, of Crosshills, *viâ* Leeds.

Beddington.—The most recent additions to St. Mary's Church consist of a new east window. The window and reredos erected at the same time as the north wing, and which were there during the Rev. J. Hamilton's rectorship, have been removed. The new window is not so deep by about 2 ft. as the one it replaces; the object being seemingly to allow the new reredos being raised. Cut in the basement stones of the arch over the window outside are *fac simile* heads of the present Bishop of Winchester (on the left hand), and on the right that of the present rector of Beddington—taken from portraits. The chancel screen has also had surmounted upon it a carved oaken cross. The screen on the west wall of the north wing is also completed, and is formed of a carved oak frame gilt, filled in with a painting of the Last Judgment. The chapel, which is undergoing repairs, is also nearly completed.

Great Yarmouth.—The topstone of the new north-west pinnacle of the south-west aisle of the parish church has been completed. The pinnacle has been finished at an expense of about 200*l.* the cost being defrayed for the most part by the ladies of the congregation.

Romiley.—The design of St. Chad's Church, Romiley, has just been completed externally by the erection of the spire. The new spire rises to a height of 130 ft. It is octagonal in shape, rising with broaches from the top of the tower and belfry-stage. It is surmounted by an iron cross and a gilt cock. The work has been carried out by Mr. S. Norcross, from the designs and under the superintendence of Messrs. Medland & Henry Taylor, the architects for the church. The cost has been only 260*l.*

Maryport.—The foundation-stone of a new church has been laid at Maryport. The proposed building is intended for a Mission Church in connexion with St. Mary's Church at Marypcrt. The site is on the north side of the harbour. The church, when completed, will seat about 500; and the estimated cost of erection is, we understand, from 1,200*l.* to 1,400*l.* It has been designed by Mr. Eaglesfield, of Maryport, architect.

Snargate.—The old parish church of Snargate has been re-opened, after its repair and restoration. The arches of the aisles and tower were hidden by unsightly boardings, and the old interior was a sad picture of what in so many of our churches has been the result of many generations of niggardly neglect and bad taste. All this is here changed, and the dimensions of the building are opened up, the nave and aisles are laid out with appropriate sittings, still leaving an open space to the west, from the font to the tower arch. The architect, whose plans have been adopted throughout, is Mr. C. T. Whitley, of Dover. The work of the chancel was executed by Mr. Ames, of Brenzett, and that of the body of the church by Messrs. Adcock & Rees, of Dover.

Bishopsgate, London.—A new chapel and schools for the district of Bishopsgate have been opened. The new chapel has been erected on the site of the Church of All Saints, Skinner-street, Bishopsgate-street Without, and. with the underlying schools, is capable of accommodating 500 boys. There are 300 sittings in the chapel, and 200 in the class-rooms underneath. Gothic of the plainest and most useful possible kind is the style of architecture of the new chapel and schools, and Mr. E. N. Clifton has been the architect, and Mr. Brass the builder. Very few persons beyond those immediately concerned, says the *Clerkenwell News*, know anything about the Great Eastern Railway Additional Powers Act. It empowered the Great Eastern Railway Company to take down the Church of All Saints, Skinner-street, in consideration of the payment of a certain amount of money compensation to the parish in which the church was located. In due time the money was forthcoming. Then came the question, what should be done with it? Should a new church be built, or what? After a good deal of deliberation on the part of the parochial authorities, they came to the conclusion that, in consequence of the great diminution of the population caused by railway incursions, and the consequent sweeping away of thickly-populated districts, it was undesirable to build another church in a thoroughfare so near the parish church, and a chapel, in which religious services, school business, and meetings and entertainments might be carried on, was decided upon. To do this, an Act of Parliament was necessary. A Bill on the subject was introduced into Parliament in 1869, which was supported by the Archbishop of Canterbury and the Bishop of London, and which, after some opposition, became law. The result is the chapel and schools which were opened on Friday last.

SCHOOL-BUILDING NEWS.

Birdsall.—The new pile of buildings, including school and master's residence, situated near the entrance to the park at Birdsall, have been opened by Lady Middleton, who laid the foundation-stone on the 8th of May last. The school is built from designs superintended by Mr. Parsons, his lordship's agent; the contractors being Messrs. Dodsworth & Wood, Malton, for the masonry and joinery work, and Mr. Smiddy, Malton, for the plumbing.

Reedham.—A new infants' and mixed school, with a master's house attached, has been opened at Reedham. It is conveniently situated on Maypole-hill, the land on which it stands having been given by Mr. W. Jary, of Reedham Hall. The external walls of the building are constructed of red brick, with black and white brick and stone dressings, and a large stone window is inserted in the north end of the school-room, smaller windows being introduced on the western side. The building, which has a lofty, open stained roof, costs, with the fencing, about 800*l.*, and will accommodate 200 children. Mr. W. P. Pearce, of Orford-hill, Norwich, is the architect; and the contractor is Mr. J. Withers, of Blofield.

Langport.—The new schools at Aller, near Langport, have been opened. The building is composed of white lias, and occupies an elevated site on the slope of a hill above the rectory grounds. It consists of a general school-room, 33 ft. 6 in. long by 17 ft. wide, plastered, ceiled, ventilated, and lighted; a class-room, 13 ft. by 12 ft.; and cloak-room, 8 ft. by 6 ft. 6 in. At the southern end is a cottage for the schoolmistress.

Boxford.—A new schoolroom, which has been planned and built by Mr. Wooldridge, of Hungerford, has been opened here. The Rev. G. F. Wells, at the opening, said,—For thirty years your rector, Mr. Wells, has endeavoured to obtain such a room as this. Last year the Government ordered that such a room should be built, for remember that, however good it looks, owing to the skill and care Mr. Wooldridge has shown, it is only built according to the requirements of Government for ninety children. The owners of property agreed to provide part of the means to build this school, the Government, the National Society, and the Diocesan Board to supplement that sum, so that now the room in which we are assembled is completed, and the cost of it will soon be paid.

Chester.—The new schools which have been erected in connexion with the Roman Catholic Church of St. Werburgh, in Queen-street, have been formally opened. There was sufficient ground, without infringing on the old graveyard, to admit of the erection of new schools without destroying the old school, that having been converted into an infants' schoolroom. The new building is a plain one, brick-built, covering an area 55 ft. by 45 ft. On the basement is the boys' school, which may be entered by two different doors from Union-walk. The principal room would be square, but for the projection of two buttresses, which are necessary to carry the timber supports of the upper school. Although these buttresses would be found to be objectionable when holding a meeting or entertainment, as they are continued upwards to the cross timbers of the roof, yet they afford corners for classes, which the teachers will know how to utilise. To each large room a smaller class-room is attached. All the rooms are lofty, well-lighted and ventilated, and will be warmed, the larger rooms by two Gill stoves in each, and the class-rooms by a fireplace in each. The entrance to the girls' school and also the infants' school, which, as already said, is the old school, is from Queen-street; and the upper school-room of the girls is reached by a broad winding staircase. Separate play-grounds and out-offices are attached to each school; and the internal fittings include new patent desks, which serve the threefold purpose of form and desk, form and table, and seat with sloping back. The schools were designed by Mr. Edmund, of Liverpool, and the builder was Mr. Andrews, of this city. The total cost is about 1,400*l.* It is estimated that the schools will accommodate 600 children.

Books Received.

"BRICKYARD CHILDREN: an Answer to the Charges of Mr. George Smith against the 'Tileries,' Tunstall. By Jno. N. Peake. Grant & Co." In this pamphlet Mr. Peake makes a vigorous, indeed over-vigorous, reply to the allegations lodged against his own establishment, and adduces evidence to show that it is well managed. Our own observations, however, on the miserable condition of brickyard children as a class were founded on the examination of many yards, and are indisputable. The interference of the legislature was loudly called for.——"The Illustrated Price Book for 1872 (Sprigg, Great Russell-street)," includes a considerable amount of useful information appended to the lists of prices.——"Mechanical Arithmetic and Mensuration. By Charles W. Merrifield, F.R.S. London: Longmans, Green, & Co. 1872." This treatise has been written as one of a series of text-books on science. It is not meant to be the first book of one wholly uninstructed in the elements of arithmetic. It gives elementary rules the precision and illustration which they need for the farther pursuit of the subject, and to the higher rules a gradual induction. The previous knowledge, however, assumed to be possessed by the student need not be great in quantity or high in quality, and all that the book contains is well known and established. There is a chapter on mechanical work, but nothing in the way of mathematical invention or discovery. The work is adapted to the use of artisans and students in public and other schools. The author is principal of the Royal School of Naval architecture and Marine Engineering. ——"The Transfer of Gas-Works to Local Authorities." By Arthur Silverthorne, C.E. London: Livermore & Robinson, Bedford-street."—The purpose of this pamphlet appears to be, to advocate the adoption of gas-works by corporate and other local public authorities,—a purpose which harmonises with our own efforts while engaged in past years in getting up and supporting the gas movement for the reduction in price and improvement in quality of the gas supplied by companies to the public. We are glad to be able to give so promising a list as the following of towns throughout England, where the exclusive control of the gasworks is now vested in the Local Board, Corporation, or Improvement Commissioners, for the time being, namely:—

Aberavon, Abergavenny, Beverley, Bingley, Birkenhead, Bradford, Blackpool, Burnley, Burton-on-Trent, Bury (Lancashire), Buxton, Carlisle, Chorley, Cleckheaton, Darlington, Devizes, Doncaster, Malvern, Halifax, Haverfordwest, Keighley, Knaresborough, Leeds, Leek, Lytham (Lancashire), Macclesfield, Manchester, Middlesbrough, Newton (Lancashire), Oldham, Richmond (Yorkshire), Ripon, Rochdale, Rotherham, Salford, Southport, Spalding, Stockport, Stockton, Teignmouth, Tenby, Wallasey, Walsall, Widness.

Thus it will be seen that the number of towns that have adopted the system of directing their own gasworks does not bear an inconsiderable proportion now even to the number of companies incorporated under special Acts of Parliament. The latter reckon at the present moment, in England and Wales, about 250, and the proportion of unincorporated gas companies to the former is in the ratio of 4 to 1. In Scotland, the towns in which the gasworks have been vested almost all lately are, Dundee, Glasgow, Perth, Paisley, Renfrew, Greenock, Arbroath, Kilmarnock, Forfar, Aberdeen.

Miscellanea.

Metropolitan Fire Accidents.—According to the usual annual report just laid before the Metropolitan Board of Works by Captain Shaw, the total number of fires to which the members of the Fire Brigade were called during the past year was 2,056. As compared with the previous year, this shows a decrease of 104. No fewer than 38 lives were lost by fire during the year. The strength of the brigade at present is as follows:—50 fire-engine stations; 93 fire-escape stations; 4 floating stations; 51 telegraph lines; 82 miles of telegraph lines; 3 floating steam fire-engines; 1 iron barge to carry a land steam fire-engine; 8 large land steam fire-engines; 17 small land steam fire-engines; 16 7-in. manual fire-engines; 56 6-in. manual fire-engines; 13 under 6-in. manual fire-engines; 104 fire-escapes; 387 firemen. The number of firemen employed on the several watches kept up throughout the metropolis is at present 107 by day, and 169 by night, making a total of 276 in every 24 hours; the number of those sick, injured, on leave, or under instruction, is generally about 40; the remaining men are available for general work at fires. It remains to be seen what the result of the Metropolis Water Act of last session will be, but it may be hoped that the provision for constant service, which comes into force on the 21st of April this year, will have the effect of at least making every fire-plug represent an immediate supply of water.

Adulteration of Gas.—The amalgamation of the gas companies does not appear to have been beneficial so far as the citizens are concerned. No doubt the amalgamated companies could, if they would, sell good gas cheaper than if they were not amalgamated; but, as we predicted at the time, they would not though they could. They are up to all such nefarious devices as tradesmen and manufacturers practise in the adulteration of their goods; anything, in their opinion, seemingly, being good enough for the stolid fools who allowed them to "amalgamate." Their gas, we should think, is common air illuminated by a little carburetted hydrogen, just as London milk is water tinctured with the product of the cow; and it saves cost to allow the sulphurous and other abominations of the vilest coal to go along with it, and so the public have their supply of brimstone gratis direct from the manufactory. As appears from the Court of Common Council proceedings, sulphur is more prevalent than ever it was in the gas supplied to the City; and in many instances the consumers' bills, notwithstanding the reduction of price from 4s. to 3s. 9d. per 1,000 ft., are larger than formerly.

Accident at a National School in Salford. An accident of an alarming nature has taken place at the National School-room in St. George-street, Salford, by which a number of young children sustained injury, and narrowly escaped losing their lives. Several workmen have been engaged in making alterations and additions in the school-rooms, and this work had not been fully completed when the children resumed their attendance at school for the first time. While the children in the infants' department were assembled, two gasfitters employed by Mr. Livingstone had passed through a trap-door to the ceiling under the roof, and continued their work immediately over the heads of the children. They were walking about, when all of a sudden the weak materials upon which they were standing gave way, and carried the two men, along with a large quantity of *débris*, down upon the children below, some of whom were for a time completely buried underneath it. The dimensions of the part of the ceiling which fell were about 18 ft. by 11 ft., and it was estimated that it weighs nearly a ton. The children were got out bruised and bleeding, but fortunately it was found that, with one or two exceptions, the injuries were not so serious as to excite apprehensions of grave results. The teacher was badly hurt.

Perils of Timber Stacks.—Last Sunday afternoon an accident, which unfortunately resulted in the instantaneous death of two little children, occurred at Mr. Bowman's timber-yard, adjoining the river at Low Elswick, Newcastle. Elizabeth Muckle, aged six years, and Thomas Henry Charlton, aged four years, had strayed from the house of their parents into the yard adjoining, in which a large quantity of thick, heavy battens were piled up in stacks. How long they were there is not known, but within a few minutes of three o'clock passers-by were startled by the crash of falling timber and a loud scream. This was enough to give the alarm, and several gentlemen at once climbed the rails into the inclosure, and then discovered that about a couple of tons of timber had toppled over, burying the two poor little companions beneath the mass. When the timber was removed, a frightful sight presented itself, and both the children were dead. It is supposed that they had been playing on the top of the timber, when the stack fell over and buried them beneath it.

The Work of the Telegraph.—It appears, with regard to the progress of the telegraph system under the Government management, that while in the financial year ended the 31st of March, 1871, the messages amounted to 9,850,177, those for the current financial year ending the 31st of March next (estimating the remaining quarter according to the average of the preceding quarters) will reach 12,410,726,—an increase of 26 per cent. The total number of offices open on the 5th of February, 1870, when the business was taken over by the State was 2,932, and it is now 5,098. These 5,098 consisted of 3,291 postal offices and 1,807 railway telegraph offices. The great augmentation has been in the postal offices, which have risen from 1,058 to 3,291; those in the London district having increased from 177 to 361, in the West of England and Wales from 605 to 1,979, in Scotland from 155 to 321, and in Ireland from 122 to 560.

The Theatre in Shakspeare's Time.—On Saturday afternoon last Mr. W. B. Donne, the examiner of plays, commenced a course of lectures in the theatre of the Royal Institution, "On the Theatre in Shakspeare's Time." Mr. Donne started at almost the very birth of dramatic writing, and traced in an interesting and instructive manner the various improvements noticeable from time to time in the construction and the general treatment of the English language. The writers of Elizabeth's time and their works were particularly dwelt upon. Some extracts from the latter were read, for the purpose of showing the point of improvement at which English literature and the drama had arrived immediately before Shakspeare made his first appearance on the scene.

State of Dwellings in Limehouse.—A report laid before the last meeting of the Limehouse Board of Works by the medical officer of health for the district describes the houses in Victoria-place, Limehouse, as being in a condition unfit for human habitation, and the Board has resolved to proceed against the owners of the property under the provisions of the Artizans' and Labourers' Dwellings Act.

The Titley and Presteign Railway.—The first sod of the projected railway from Titley to Presteign has been turned at Presteign, amidst general rejoicing. Presteign is the county town of Radnorshire, and an important centre of business for the county. The projected line, when completed, will be about five miles in length, and will cost about 23,000*l*. It will form a junction with the Leominster and Kington Railway, near Titley. It will probably in a short time be continued on towards Rhayader and the Central Wales line. Another line has been partly constructed from Eardisley to Kington. Direct communication will then be made with the immense fields of industry in South Wales. Lime will then find a ready demand at the hands of the South Wales iron-masters, and coal will be cheapened. The contractors for the line are Messrs. Perry & Sons, of Stratford, London; and the engineer, Mr. W. Clarke, C.E., of London.

Proposed Trades Hall for Manchester.—A meeting of delegates from the various trade societies in Manchester has been held at the Typographical Institute, Water-street. Mr. S. C. Nicholson occupied the chair. The Rev. H. Solly having addressed the meeting, the following resolution, proposed by Mr. W. H. Wood, and seconded by Mr. J. M'Kenna, secretary of the Coachbuilders' Society, was adopted:—"That premises be secured for a social club for the accommodation of the trade unionists of Manchester and Salford as near the centre of the city as possible, to be opened to members contributing 5s. per annum, rooms in the same to be let for the accommodation of trade societies at reasonable rentals." Mr. W. H. Wood, in support of the scheme, urged that such a club would answer exactly the same purpose as those occupying a higher grade in the social scale.

Removal of a Toll.—The *South London Chronicle* says,—"That obnoxious obstruction, the halfpenny-hatch in Baalzephon-street, which so long placed a barrier to free communication between Bermondsey and Newington, has at length been removed; and now the hundreds of workmen whose nearest route to their daily labour lay through the hatch can take the nearest cut, and laugh at all that remains of almost the last remnant of a bygone system of tollage. We may add that the Bermondsey vestry, sensible of their position as non-obstructors, have determined to remove the only public bar which now exists in the parish,—*i.e.*, the one that blocks up Smith's-buildings, Edward-street. There still remains the toll on Waterloo Bridge. Now that the City has done thus much for Bermondsey, is it not time that the Metropolitan Board tried to give a like relief to the whole of London?"

Royal Dublin Society's School of Art.—The annual exhibition of the students' works of this school has been opened to the public free daily. The grand staircase, long statue gallery, and adjoining rooms are filled with art works hung and catalogued to the unprecedented number of 607, comprising drawings of the human figure, landscapes from nature, architectural drawings, and surface designs. The silver medal for architecture was awarded to Mr. J. Bouchier for a drawing made from actual measurement of the Royal Dublin Society's House; also in orthographic projection and perspective and practical geometry bronze medals were awarded, the recipients being Mr. Beardwood, Mr. Robert Smith, and Mr. Tighe. For some of the designs for cabinet, damask, fans, dinner-plates, lace, surface decoration, carpeting, and wall paper, the leading manufacturers offered first and second prizes of 5*l*. and 3*l*. Mr. Lyne is the head master, and his assistants are Mr. Byrne and Mr. Murray.

The Park-lane Sewer.—In the St. George's, Hanover-square, Committee of Works, General Sir William Codrington, according to notice, moved "That the surveyor lay before the Committee of Works and the Vestry a plan and sections of the main drains of Park-lane and Piccadilly towards the south end of Park-lane; also of plans and levels of any house-drains in that neighbourhood which communicate with the main sewers, and of which complaint has been made." His only object in this motion was to obtain the requisite information. Mr. Walker seconded. Mr. John Morris suggested that a plan of the basement of Gloucester House should be added. Mr. Cove thought, now that the sewer in Park-lane was working in a satisfactory manner, the motion seemed unnecessary. The motion, being put, was carried.

Effects of the Gale.—A very heavy gale visited the metropolis on Tuesday night, accompanied with torrents of rain. Many accidents are reported, and amongst them is the fall of one of the large pinnacles from the central tower of the Westminster Palace. Destructive floods are reported from many parts of the provinces. At Chelsea the gale was severely felt, and a stack of chimneys fell down in Lower Sloane-street, causing the death of a lady named McGarth, who resided at No. 77. It appears that between the house in question and No. 76, which was occupied by Mr. Bancks, the well-known dyer, was a high stack of chimneys, and about half-past five, when the gale was at its height, the stack fell with a tremendous crash, half falling through the roof of No. 76, and the other half through 77. The storm raged with great fury at Cambridge. In fact, there was a perfect hurricane of wind nnd rain. Buildings in course of erection in various parts of the town were blown down.

Tradesmen and International Bazaars and Exhibitions.—A public meeting, convened by the Metropolitan and Provincial Association for the Defence and Advancement of Trade Interests, has been held in the Egyptian-hall, at the Mansion House. The chair was occupied by the Lord Mayor and Mr. Alderman Finnis successively. The meeting was numerously and respectably attended. The following resolutions,—

"That this meeting views with regret and alarm the determination of the Royal Commissioners to convert the International Exhibitions at South Kensington into enormous retail shops; and pledges itself to use every loyal means to prevent the intended scheme being carried into effect;"

"That the following gentlemen, with power to add to their number, do form a standing committee for the purpose of removing the grievance already complained of, by a humble address to her Majesty, petitions to the Houses of Parliament, and by using all other available means to oppose this objectionable scheme:—The Lord Mayor, Mr. Alderman Finnis, Mr. R. Crawford, M.P., Sir Robert Carden, and Messrs. Attenborough, Daniell, Copeland, Gotto, Blackwell, Pedler, Harrison, and P. Graham, with power to add to their number,"—

were separately moved, and unanimously passed, by the meeting.

A "Quarter-Turn Full-Way High-Pressure Water Valve."—In reference to a valve so named the inventors, Messrs. Carr & Claret, sanitary engineers, state that it "opens full bore with a ¼ turn, and can thus be used in all situations in which the ordinary cock is applicable," so disposing of the objection (often raised with respect to valves) of a number of turns, and that, "unlike all previous valves, it is *actually* a *full-way* valve," whereas, "even the so-called round way cocks are not *absolutely* full way, while most valves and common cocks are little more than half full way." The disc which closes the aperture (in other words, the valve proper) is fitted with ¼-in. solid mineralised indiarubber, which is said to be, in practice, almost imperishable, when used even for boiling water. The cost of the valve is said to be much lower than even the commonest valves yet made. It ought to come into use.

The Park-lane Improvement.—At the St. George's (Hanover-square) Committee of Works, a letter was read from the Metropolitan Board of Works, asking the vestry to assume the charge of the new foot and carriage ways in connexion with the Park-lane improvement. The surveyor (Mr. Tomkins), in answer to questions, said that the roadway in Hamilton-place was now in excellent condition. A short time ago, 3 in. of granite kerb were laid down. Mr. Walker said the road was as good a road as any in the parish. The committee decided to take to the road in accordance with the request of the Board; and it was understood that the refuge at the top of Hamilton-place would be removed, it being considered dangerous.

Masters and Men.—The proprietor of the West Central Iron-works, Drury-lane, and the South-Western Iron Foundry, Paradise-street, Lambeth, Mr. George B. Cooper, having conceded the nine hours per day to his workmen, from January 1st last, they presented him, on Monday evening, January 15th, with an address, accompanied by a silver inkstand, designed and manufactured specially by Messrs. Elkington. Mr. Cooper received the present with much feeling, and in speaking of the movement, said it had his support, and he hoped that the time acquired by his men would be used for their moral and mental improvement. His son, Mr. L. E. Cooper, afterwards read an address to the workmen.

Value of Land in London.—The freehold property, Nos. 27 and 28, Milk-street, Cheapside, was sold at the Mart by Messrs. Debenham, Tewson, & Farmer. It consisted of two old houses, covering a site of 1,780 ft., and realised 8,650*l.*, or over 4*l.* 17s. per foot.——With reference to a paragraph we quoted in our last from a City paper, as to a sale of land in Lombard-street, a correspondent acquainted with the circumstances writes to say that "it gives a false impression as to the value of land per foot. The amount in question comprised compensation for a retail business, and there are other exceptional matters connected therewith, which would reduce the value referred to, which I, as one having taken a prominent part therein, can well testify to."

Instruction in Science and Art for Women.—By permission of the Lord President of the Council, a course of six lectures, on the most celebrated and influential composers of Italy, France, England, and Germany, for the clavecin and the pianoforte, in connexion with the general history of music of the eighteenth and nineteenth centuries (illustrated by performances on the pianoforte), will be delivered on Monday afternoons, the 5th, 12th, 19th, and 26th of February, and the 4th and 11th of March, at half-past two o'clock precisely, by Mr. Ernst Pauer, in the Lecture Theatre, South Kensington Museum.

Junior United Service Club House.—This building, situate in Charles-street, St. James's-square, had a narrow escape from being destroyed by fire on Monday night. It appears that the members, during the whole of the day, had experienced a smell of burning wood, and at last flames were seen playing round one of the pillars in the coffee-room on the ground floor. On making a closer inspection it was found that the ceiling, to the extent of 35 ft., with the wood lining and supports, was on fire, and that the flames had actually penetrated the flooring in the first floor. With the aid of a number of Shand & Mason's hand-pumps the fire was extinguished. The cause of the fire has been traced to a defective flue.

The "Abbotsford Grate."—The bars are placed close down upon the hearth, the space for the fire being lined at the sides and back with fire-brick, and instead of a grate forming the bottom, a fire-brick lump, fitting into and resting on a cast-iron tray, forms the bed upon which the coal is burnt, and all are so constructed as to be renewable at any time without unsetting the grate. It is said that "the warming power of the grate is in excess of the ordinary construction, in proportion to the amount of fuel burnt, and the fire-brick lump at the bottom secures the most complete combustion."

A New Theatre in South London.—We understand that a new theatre is about to be erected in Newington-causeway, not far from the Elephant and Castle inn. The site is said to be the extensive premises, situated on the western side of the road, and until recently occupied and known as the Steam Wheel Works. It is stated that the new building, the erection of which is immediately to be commenced, will be on a very extensive scale, and large enough to hold an audience of more than 3,000 persons.

The Hull Water Supply.—A report to the Hull Corporation Waterworks Committee on the proposed additional works for the supply of the town from Springhead, by the engineer to the waterworks, Mr. Thomas Dale, has been printed by authority. It develops three several plans,—one for pumping all the water for the town's use direct from Springhead, at a cost of 79,814*l.*; the second, for supplying the west district direct from Springhead, at a cost of 61,372*l.*; and the third, for supplying water to the Stoneferry works from Springhead, at a cost of 26,977*l.*

Endowment of the Convalescent Hospital, Dundee.—Sir David Baxter, bart., of Kilmaron, offered to the directors of the Dundee Infirmary, a few weeks ago, to build a convalescent hospital for from fifty to sixty inmates, at a cost of from 6,000*l.* to 8,000*l.* He also promised to give the sum of 10,000*l.*, provided an equal amount were given by others, for its endowment. Sir David has now written to the chairman of the infirmary, intimating that the other 10,000*l.* has been subscribed by his private friends, and that Messrs. Shiell & Small are preparing the deed of constitution.

Church-Building at Aldershott.—It is proposed to build a new church at Aldershott capable of accommodating 1,000 persons.

Ventilation of the Court of Queen's Bench.—The bench, the bar, and the reporters at the Court of Queen's Bench joined in complaining on Saturday of the ventilation of that court. Mr. Manisty having to apologise for the loss of his voice through a severe cold caught in the court, Mr. Justice Blackburn wished that matters might be re-arranged, so as to give the bench a little of the air of which the bar appeared to have too much. From other parts of the court there were equally emphatic complaints on the same subject.

The Royal Academy.—The election of two Associates to fill the places of those who were admitted into the rank of Academicians Elect in November last,—viz., Mr. Dobson, the painter, and Mr. Lumb Stocks, the engraver, is to take place on the 29th of the present month. The candidates whose names have for a length of time been on the list of those who desire to belong to the Academy and have put down their names in accordance with the custom adopted, number, according to the *Daily News*, no fewer than 64 painters, 15 sculptors, and 13 architects.

Institution of Surveyors.—At the ordinary general meeting, held on Monday, January 15th, the adjourned discussion on Mr. Clutton's paper, entitled "The Cost of Conversion of Forest and Wood Land into Cultivated Land," and Mr. Grantham's paper, entitled "Agricultural Pipe Drainage in connexion with Arterial Drainage and Outfalls," was resumed, and, after a long debate, concluded. At the next meeting, January 29th, a paper will be read by Mr. E. J. Smith, entitled "Land."

Concrete Gas-holder Tank.—We have been informed that there is now in course of construction at the South Metropolitan Gas Company's premises, Old Kent-road, a concrete gas-holder tank, 152 ft. in diameter, by 38 ft. 6 in. deep to top of rest stones. We believe that this is the first instance of concrete being adapted for this purpose. The work is being carried out by Messrs. Thos. Docwra & Son, from designs by and under the direction of Mr. G. Livesay, the company's engineer.

The Leicester Municipal Buildings.—No official reply comes to our inquiry as to carrying out the selected design, but we have received several letters reiterating it, and expressing hope that the council intends acting fairly. The selected design, it should be understood, is the joint work of Mr. T. Barnard, of Leicester, and Mr. William Smith, of John-street, Adelphi, London.

Islington Workhouse.—The plans for the alteration of the old workhouse in Liverpool-road, Islington, have been laid before the Local Government Board, who have replied, through their architect, to the effect that no answer can be given for some weeks to come. In the mean time, the guardians have resolved to proceed with the demolition of the old buildings, so that they shall be ready to proceed with the new ones as soon as the plans are approved.

Luxembourg Cathedral.—This building has been lighted with gas by Messrs. Cox & Sons, of Southampton-street. Massive standards, the bases iron, and the upper parts in polished brass, with foliations, introducing coloured crystal jewels are used for the nave, and a number of polished brass brackets, of a design to correspond with the standards, have been supplied for various parts of the building.

Bangor Cathedral.—The restoration of the Bangor Cathedral, says the *Rock*, has come to a standstill. About 5,000*l.* are still required, and the means at the disposal of the committee are exhausted. Lord Penrhyn, who has contributed 3,000*l.*, has undertaken works which will cost 2,000*l.* more. Mr. Kneeshall offered 100*l.* if nine others will give a like amount. The bishop, Mrs. Campbell, the dean, and Lord Boston have already given in their names.

Aberdeen Builders.—At a meeting of the representatives of the employers of the building trade (with the exception of the masons) in Aberdeen, it has been resolved to intimate to the men their willingness to concede that the hours of labour, after the 1st of June, be fifty-two per week, without reduction of pay.

Utilisation of Sewage.—The Banbury Board of Health has agreed to purchase an estate, at a cost of 23,400*l.*, for the purpose of utilising the sewage of the district. An examination has been held by a Government commissioner, no opposition being offered.

Sculpture in Spain.—The municipal council of Madrid have invited a competition among the artists of Spain to decorate the Plaza de la Independencia with six or eight statues of the heroes of the War of Independence.

TENDERS

For building new rectory house, at March, Cambridgeshire. Mr. William Smith, architect:—

Swann, jun.	£2,590	0	0
Broadhurst	2,468	0	0
Law & Son	2,378	0	0
Hutchinson	2,309	0	0
Bennett	2,160	0	0
Brown (accepted)	2,020	0	0

For rebuilding rectory house, at Doddington, Cambridgeshire (destroyed by fire). Mr. William Smith, architect:—

Richardson & Son	£4,249	0	0
Thompson	3,982	0	0
Brown	3,962	0	0
Law & Sons	3,667	0	0
Bell & Sons	3,654	0	0
Fast (accepted)	3,550	0	0

For erecting new farm buildings, &c., on Dodd's Charity Estate, at Kimblewick, Bucks. Messrs. Brown & Foulkes, architects:—

Syred	£478	0	0
White	473	5	0
Fitkin	444	5	0
Callam	409	10	0
Batting	403	10	0
Mayne & Son	332	0	0
Snell	321	13	3

For the erection of a house, Elmsleigh, Leicester, for Mr. John Stafford. Messrs. Picton, Chambers, & Bradley, architects. Quantities supplied:—

Hobson & Taylor	£8,777	0	0
Bayes & Ramage	8,182	0	0
Thompson	8,110	0	0
Hughes	7,900	0	0
Urmson	7,787	0	0
Stevenson & Weston	7,770	0	0
Eagle	7,400	0	0
Loveday	7,350	0	0
Messrs. Herbert	7,048	0	0
Osborn, Brothers	6,780	0	0
Barnes & Moody	6,595	0	0
Neale & Sons (accepted)	6,499	0	0

For rebuilding a warehouse, in Cannon-street, City, and alterations and additions to five adjoining. Mr. Herbert Ford, architect. Quantities supplied by Messrs. Karslake & Mortimer:—

Meyers & Son	£11,801	0	0
Higgs & Son	11,186	0	0
Hill, Keddle, & Waldram	11,170	0	0
Brass	10,710	0	0
Conder	10,529	0	0
Perry & Co.	10,335	0	0
Gammon & Son	10,063	0	0
Stimpson	9,993	15	0
Turner & Son	9,643	0	0
Scrivener & White	9,533	0	0
Williams & Son	9,488	0	0
Brown & Robinson	9,464	0	0
Henshaw	9,261	0	0
Killby	9,200	0	0
Perry, Brothers	9,173	0	0

For alterations to union workhouse, at Pwllheli. Mr. R. G. Thomas, architect:—

Lloyd	£1,194	0	0
D. Williams	999	0	0
Griffith	989	0	0
Messrs. Roberts	947	0	0
J. Jones	834	0	0
W. Jones	800	0	0
J. Williams	765	0	0
R. Jones	752	0	0
Griffiths (accepted)	721	0	0

For new house, at Menai Bridge, for Mr. R. G. Thomas, architect:—

J. Williams	£748	17	2
E. Williams	660	0	0
Thomas	590	0	0
J. Williams	580	0	0
R. Jones	562	0	0

For the erection of new tavern and outbuildings, on the new Sussex Cricket-ground, Hove. Mr. J. Woodman, architect. Quantities supplied by Mr. B. H. Nunn:—

Cheesman & Co.	£3,320	0	0
Parsons	2,090	0	0
Nash & Co.	2,084	0	0
Patching & Son	2,076	0	0
Lancaster	2,067	0	0
Blackmore & Howard	1,995	0	0
Lockyer	1,955	0	0
Anscombe	1,949	0	0
Barnes	1,924	0	0

For new house and business premises, on the Stoke Lodge Estate, Guildford, for Mr. W. Tucker. Mr. Henry Peak, architect:—

Burdett	£609	15	6
Moon	606	10	0
Mason	595	0	0
Strudwick	590	0	0
Garnett (accepted)	538	12	0
Swayne	398	11	0

For teacher's house, and enlarging the national school buildings, at Compton, Surrey. Mr. Henry Peak, architect:—

Messrs. Loe	£695	0	0
Hibbins & Co.	528	0	0
Moon & Son	495	0	0
A. Moon	480	0	0
Sturdy	475	0	0
Mitchell (accepted)	475	0	0
Strudwick	469	0	0
Mason	464	5	0
Lucas	440	12	0
Cooper	313	0	0

For Bexley Bridge, Kent. Mr. Martin Bulmer, architect:—

Booker	475	0	0
Lacy & Co.	451	0	0
Lucas	422	10	0
Webb	412	0	0
Featherstone	400	0	0
Blake	395	0	0
Dover & Co.	357	0	0
Allard (accepted)	340	0	0

For Drayton Schools, near Abingdon:—

	House.			School.		
Whiting & Tosland	£471	0	0	£779	0	0
King	408	0	0	812	0	0
Wheeler & Gregory	467	0	0	680	7	0
Williams	341	0	0	690	0	0
Bryan (accepted)	300	0	0	670	0	0

For repairs and alterations at the St. George's Baths and Washhouses, Buckingham Palace-road. Mr. W. R. Gritten, architect. Quantities supplied:—

Colwill	£765	0	0
Thomas	728	10	0
Allard	687	16	0
King & Son	670	0	0
Wright	628	10	0
Sale	621	0	0
Nichols & Goodair	602	0	0
Bennett	596	10	0
Biggs	586	0	0
Jenner	560	0	0
Pullen	555	0	0
Rogers	550	0	0
Kearly	530	0	0
Woodcock	530	0	0
Carter & Son	457	0	0

For the erection of St. John's District Projected Schools, Woolwich:—

Wagner	2,995	0	0
Messrs. Hosking	2,987	0	0
Lord	2,981	10	0
Johnson	2,766	0	0
Mann	2,727	0	0
Priestley	2,680	0	0
Gibson	2,677	0	0
Lonergan	2,672	0	0
Waterson & Co.	2,650	0	0
Kirk (conditionally accepted)	2,464	0	0
Shepherd	2,400	0	0
Hughes	2,364	0	0

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IF Mr. JONATHAN SAMUEL BENNETT, who formerly superintended the erection of a mansion, at Montserrate, near Cintra, in Portugal, should wish for fresh EMPLOYMENT, in that country, he is requested to communicate with T. H. WYATT, Esq. 77, Great Russell-street, London, W.C. January, 1872.

TO ARCHITECTS.—The Aberystwyth School-Board are prepared to receive APPLICATIONS for the APPOINTMENT of ARCHITECT to the Board.—Letters, stating terms, &c. to be sent in to the Clerk of the Board not later than FRIDAY, the 9th day of FEBRUARY next.

TO SEWAGE FARMERS AND OTHERS.
THE Local Board of West Derby REQUIRE a competent person to SUPERINTEND the LAYING OUT of their SEWAGE FARM at Fazakerley, near Liverpool, in accordance with the plans of the Board's Engineer and Surveyor. Applicants must give particulars of their experience, previous engagements, age, and salary required. Written applications to be sent in before SATURDAY, the 10th prox.—By order,
RADCLIFFE & LAYTON, Clerks to the Board.
Public Offices, Green-lane, Tue-brook, near Liverpool, 23rd January, 1872.

PRESTON SCHOOL of ART.—WANTED, a MASTER, qualified under the Art and Science Department, to enter upon his duties immediately after the Midsummer vacation. Net emoluments from fees and grants have been about 130*l.* per annum, whilst the locality offers a favourable field for an efficient master increasing their amount.—Testimonials and applications to be addressed to W. NEWSHAM, Hon. Sec. School of Art, Avenham, Preston, and forwarded to him on or before FEBRUARY 10th, 1872.

PARTNER WANTED, with about 3,000*l.* to JOIN Advertiser and Another to WORK a valuable BUILDING STONE QUARRY and GREY STONE LIME WORKS, near London. Lease 60 years. The capital is required for extending plant and for working capital.—Apply, by letter, to Messrs. LAMBERT, BERGIN, & PETCH, 8, John-street, Bedford-row, W.C.

JUNIOR CLERK WANTED, in an Architect's Office. Must write a good hand, and be able to copy drawings neatly.—Address, stating salary, A. B. 16, Great Marlborough-street, St. James's, Westminster.

PUPIL WANTED, in an old-established ARCHITECT'S Office. Moderate premium only required.—Address, C. D. Mr. Reid, Stationer, 5, Great Portland-street, Oxford-street.

OUT-DOOR APPRENTICE WANTED by a Builder and Surveyor.—Apply to Mr. HOOTON, 2, Clifton-villas, Forest-hill.

WANTED, immediately, One or Two experienced WOOD CARVERS.—Apply to SAMUEL BARFIELD, Architectural Sculptor: Office, 6, Friar-lane, Leicester.

WANTED, immediately, in the Office of an ARCHITECT and SURVEYOR, a CLERK, who will make himself generally useful. One having had experience in a builder's office, able to prepare bills of quantities, and measure builder's work, preferred.—Apply, by letter, stating age, qualifications, and references, to J. B. 15, Newland, Lincoln.

WANTED, a really first-class DECORATIVE ARTIST and DESIGNER. Must be able to show specimens, and give best reference. State age and terms, to 833, Office of "The Builder."

WANTED, in a Jobbing Shop, at the West-End, an active WORKING FOREMAN of CARPENTERS and JOINERS. Must have filled a similar situation.—Send full particulars to 852, Office of "The Builder."

WANTED, a respectable BOY, in an Architect and Engineer's Office, in the Euston-road. One who can trace preferred.—Apply by letter, stating wages, and full particulars, to L. W. 7, Lander-terrace, Wood-green.

WANTED, by a Firm of Builders, a thoroughly competent CLERK and BOOK-KEEPER.—Apply by letter, stating where last employed, age, and salary required, to Y. Z. 23, Thavies-inn, Holborn, E.C. Applications not later than WEDNESDAY, the 31st instant.

WANTED, a SALESMAN in a CHURCH FURNITURE WAREHOUSE. Must be a good draughtsman, and well up in Gothic details. One accustomed to designing fittings and furniture preferred.—Address, with references, and state salary expected, S. care of B. Wheeler, Newsagent, Manchester.

WANTED, a BRICKMAKER to make a Million Bricks by one of Porter's machines.—Apply to Messrs. PERRY & CO. Pensford, Bristo